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BRITISH GUIANA

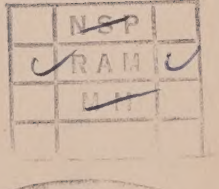
ANNUAL REPORT

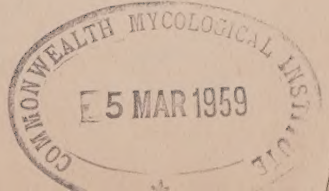
OF THE

DIRECTOR OF AGRICULTURE

FOR THE YEAR

1957





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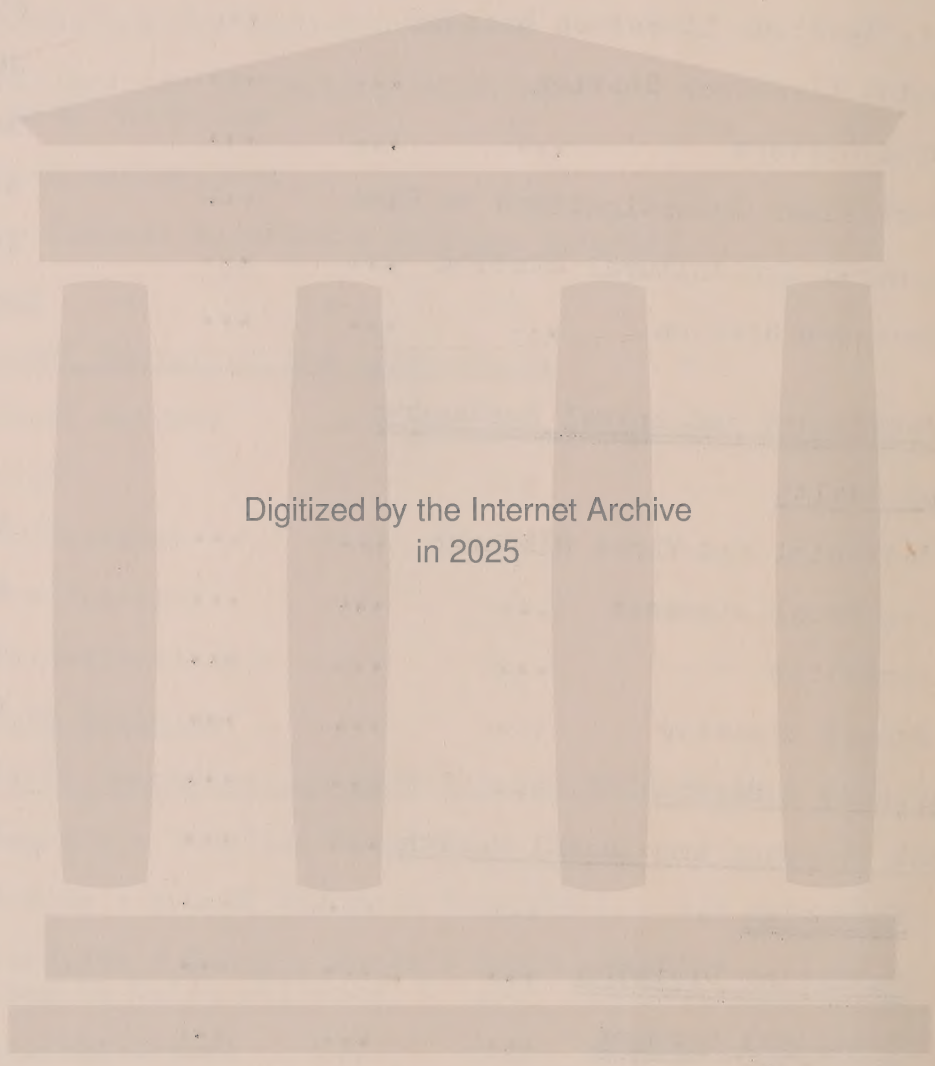

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PREFACE

General Statement of Agricultural Policy for British Guiana, 1957

The general agricultural policy is to foster and increase the economic production of crops and livestock by enlarging areas under cultivation, by making better use of land with improved and higher yielding types of crops, by the use of fertilizers and the improvement of husbandry generally and to concentrate on and make the best use of measures to improve those crops which are particularly suited to conditions in the country and are already the dominant factors in the agricultural economy namely, sugar, rice, milk and beef production, coconuts and food crops.

An essential element of the policy is the introduction, testing and encouragement of new crops which may be suitable for the country and the importation of suitable breeds of animals for improvement of livestock production, with a view to diversifying agricultural production, and affording new opportunities to farmers to improve their economic status and generally raise the standard of living in a predominantly agricultural country.

To implement this policy the Department undertakes extensive and intensive research into the problems of agriculture generally to seek information and provide a sound basis for advising the farming community. It provides an Extension Service to disseminate new ideas and give practical held to the farmers and, in co-operation with all other departments and agencies, seeks to provide the necessary advice and guidance on the agricultural development of the country as a whole.

The policy adopted in achieving this objective will be:-

(i) to give priority to measures which will provide an early increase in economic agricultural production. This will include:-

  (a) undertaking research into methods of increasing the efficiency and volume of agricultural production;

  (b) providing extension services to farmers and training in scientific agriculture for staff and suitable members of the farming community, particularly youths;

  (c) organising and rationalising marketing and processing of produce to enable the farmer to obtain the maximum return for his produce.

(ii) to ensure that the cultivated lands of the coastal plain and river banks are used to the best advantage, the development of new areas, having particular regard to efficient production and the maintenance of soil fertility;

(iii) to co-operate with agencies providing adequate credit to farmers on terms commensurate with their standard of development and their sense of responsibility in such matters;

(iv) to investigate and encourage the agricultural development of the Interior with the view, firstly, of making the indigenous population as self-supporting as possible and, secondly, of developing non-perishable high value crops for export; and

(v) to work in close collaboration with and to assist all agencies connected with rural and interior development.

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SECTION I

AGRICULTURE IN THE COLONY

WEATHER CONDITIONS

The total rainfall for the year was 59.19 inches, as compared with 120.90 inches in 1956, and with 93.27 inches, the average precipitation over the past 77 years (1880 - 1957).

2. For the first four months of the year the distribution of rainfall was very poor, with totals of 5.14, 1.56, .17 and 1.74 inches respectively, the total .17 parts for March being the lowest on record. The long wet season commenced in May, and came to a sudden halt towards the end of July, the totals for these three months, May to July, being 11.49, 8.54 and 9.33 inches respectively.

3. The unexpected break of the wet season resulted in an unusually long dry period, causing severe loss to farmer Around mid-November, the "Christmas rains" started and continued to the end of December, with 4.06 and 12.02 inches respectively. Rain fell on 183 days of the year as compared with 248 days in 1956 The highest fall for any one day was 3.34 inches on 14th May.

4. The highest shade temperature for the year was 90.1°F. on 24th October, the record being 93.0°F. on 22nd September, 1955.

CROPS

SUGAR

Output

5. In 1957, 284,973 tons of sugar were produced, 280,117 tons by estates and 4,856 tons by cane farmers. This wa a record for the industry exceeding the 1956 production by 21,640 tons.

6. 83,432 acres of sugar cane were reaped, of which 81,108 acres were reaped by estates and the remainder by cane farmers. The average yield in tons commerical sugar per acre for all varieties on estates was 3.62 tons as compared with 3.67 in 1956. The average yield for the industry was 3.42 tons commercial sugar per acre compared with 3.47 tons per acre in 1956.

7. Table I gives details of production for the year.

Varieties

8. In 1957, B.37161 and B.41227 continued to be the main commercial varieties. Varieties B.4098, B. 47225 and B.4362 occupied only 14.6% of the acreage between them and showed no increase. No variety shows signs of rivalling the two main varieties. The variety position is dictated by yielding ability and tolerance or resistance to Leaf Scald disease.

9. The following Table II shows the distribution of varieties grown on sugar plantations and reaped in 1957:-

TABLE I

SUGAR AND RUM STATISTICS, BRITISH GUIANA, 1956 - 1957

Year	Area reaped (including farmers' canes) - English acres			Sugar produced (including farmers' canes) - Tons			Yield per acre - Tons			Rum produced - Proof gallons		
	Berbice	Demerara	Colony	Berbice	Demerara	Colony	Berbice	Demerara	Colony	Berbice	Demerara	Colony
1956	28,734	47,097	75,831	98,826	164,507	263,333	3.44	3.49	3.47	1,185,468	2,127,474	3,312,942
1957	33,469	49,963	83,432	120,936	164,037	284,973	3.61	3.28	3.42	1,215,990	2,284,814	3,500,804

TABLE II

Variety	Percentage distribution in the Colony 1956	1957
B.37161	39.5	43.1
B.41227	31.0	32.0
B.4098	8.1	5.4
B.47225	5.0	5.0
B.4362	4.6	4.2
B.47258	.7	2.6
Pindar	1.7	2.3
Co.419	1.4	.9
B.46378	.6	.6
B.47379	.5	.5
B.34104	2.6	.4
D.37/45	.6	.4
B.4373	-	.3
B.40105	.8	-
Other varieties	2.9	2.3
Total	100.0	100.0

Pests and Diseases

10. Leaf Scald disease continued to be controlled by the use of resistant varieties and the area planted to susceptible varieties was reduced to less than 3% of the 77,000 acres grown. Incidence of the disease was less severe on scattered plantings of B.34104 than in 1956.

11. Chlorotic streak was prevalent throughout the sugar-cane growing area.

12. Froghopper was reported from the peasant cane-farming areas but B.H.C. dusts continued to give control.

Fertilizers

13. The quantities of, and the expenditure on, the various fertilizers used on the sugar estates in British Guiana for the years 1955, 1956 and 1957 are presented in Table III.

14. The rate of application of nitrogen in the form of sulphate of ammonia remains at the usual standard rates although supplementary applications based on the results of foliar analysis are increasing in number. However, the rate of application of phosphates has increased as has that of potash although when considered in relation to the acreage under cane, the amounts of phosphatic and potasic fertilizers used at present must be regarded as being on a very moderate scale.

15. The tonnage of limestone purchased in 1957 shows an increase over that of the previous year but below that of 1955. Considering the low pH values of most of the soils on which sugar-cane is grown, considerably larger quantities of limestone are required annually. The relatively high cost of this material is undoubtedly the major factor responsible for applications being kept at what may be regarded as essentially minimum calcium maintenance rates.

16. The expenditure on fertilizers and limestone continues to increase, the amount thus expended in 1957 by the sugar industry being in excess of four million dollars.

Marketing

17. Total exports of sugar amounted to 255,536 tons, an increase of 9,625 tons on the exports of 1956. The average export

VALUES AND QUANTITIES OF FERTILISERS USED ON SUGAR ESTATES, 1955 - 1957

	Ammonium Sulphate			Superphosphate			Hyperphosphate			Muriate of Potash		
	1955	1956	1957	1955	1956	1957	1955	1956	1957	1955	1956	1957
Quantity-Tons	14,212	14,708	19,458	2,876	3,059	2,738	1,017	1,504	3,700	645	1,149	1,930
Value - $	1,708,630	1,871,436	2,196,724	478,676	519,603	449,709	88,193	138.492	321,835	74,631	134,418	215,209
Cost per Ton - $	120.22	127.24	112.90	166.43	169.90	163.88	86.75	92.08	86.98	115.74	116.94	111.51
% of Total Quantity	42.0	45.6	48.5	8.5	9.5	6.8	3.0	4.7	9.2	1.9	3.6	4.8
% of Total Value	62.8	62.0	56.4	17.6	17.2	11.5	3.2	4.6	8.3	2.7	4.5	5.5

	Limestone			Urea			Di-ammonium Phosphate		
	1955	1956	1957	1955	1956	1957	1955	1956	1957
Quantity-Tons	14,552	11,492	11,700	33	153	488	-	-	110
Value - $	315,652	292,157	295,607	8,562	40,017	114,582	-	-	301,763
Cost per Ton - $	21.69	25.42	25.27	255.95	261.79	234.80	-	-	274.33
% of Total Quantity	43.1	35.6	29.2	0.1	0.5	1.2	-	-	.3
% of Total Value	11.6	9.7	7.6	0.3	1.3	2.9	-	-	7.8

TABLE IV

EXPORTS OF SUGAR AND BY-PRODUCTS, BRITISH GUIANA, 1956 - 1957

Year	Sugar			Rum			Molasses		
	Tons	Value	Value per ton f.o.b.	Proof Gallons	Value	Value per gallon f.o.b.	Gallons	Value	Value per gallon f.o.b.
1956	245,911	$41,622,197 £8,671,291	$169.26 £35.26	2,616,372	$3,752,792 £781,831.6	$1.43 £0.30	6,209,188	$992,492 £206,769.2	$0.16 £0.03
1957	255,536	$53,595,028 £11,165,638	$209.74 £43.69	2,815,614	$4,007,863 £834,971.4	$1.42 £ .30	9,233,576	$2,169,391 £451,195.6	$0.23 £0.05

price was $209.74 per ton as compared with $169.26 per ton for 1956. The export of rum was 2,815,614 proof gallons and the f.o.b. price was $1.42 per gallon as compared with $1.43 in 1956. The export of molasses was 9,233,576 gallons as compared with 6,209,188 gallons in 1956 and the f.o.b. price was 23 cents per gallon.

18. Exports of sugar to the United Kingdom under the Commonwealth Sugar Agreement were 153,181 tons at $202.40 per ton c.i.f.

19. Local sales of sugar increased by 693 tons to 18,612 tons. Similarly local sales of rum rose to 524,519 proof gallons, an increase of 13,830 proof gallons.

20. Table IV summarises the export trade in sugar, rum and molasses.

RICE

Output

21. There was an increase in the acreage but a decrease in production as compared with 1956. The total area cultivated for the autumn crop was 136,990 acres, producing an estimated yield of 52,179 tons of rice. Including the spring crop, rice was cultivated on 152,475 acres compared with 136,000 acres in 1956, producing an estimated 57,449 tons of rice compared with 78,500 tons in 1956. This substantial drop in production was due to the drought which lasted from August until November, and although strenuous efforts were made to pump water on to the fields, at least one-third of the crop was lost. Table V summarises the production of rice.

TABLE V

Year	Total Estimated Acres (Spring and Autumn Crops)				Estimated Yield
	Berbice	Demerara	Essequibo	Total	Tons of Rice
1956	54,200	53,800	28,000	136,000	78,500
1957	67,791	58,292	26,392	152,475	57,449

Supply of Pure Line Seed

22. Pure line seed padi was produced at the Anna Regina and Cane Grove Land Settlements under the supervision of the Department of Agriculture. A total of 7,796 bags (140 lb. net) was available from the 1956 crop for distribution in 1957, producers being paid $7.75 per bag. This seed was despatched to Agricultural Officers in all rice growing districts and was sold at $8.75 per bag.

23. The steady improvement in the yield of padi on farmers' lands and in the quality of marketed rice in certain areas is due largely to this scheme which has become an integral part of the organisation of the industry.

24. Notwithstanding this scheme, rice farmers in all districts were encouraged to produce their own pure line seed under supervision of Agricultural Instructors. This seed was purchased subsequently by the Department, then handed over to Rice Producers' Association for resale to farmers. The price structure for this seed padi was essentially similar to that from Anna Regina. 458 bags were available for distribution from this source.

Marketing

B.G. Rice Marketing Board

25. The B.G. Rice Marketing Board continued to be responsible for the internal and export marketing of the entire production of rice.

26. The quantity of rice delivered to the Board during its financial year 1st October, 1956 to 30th September 1957 was 742,603 bags (180 lb. gross weight) equivalent to 59,673 tons. This represents a reduction of 10,204 bags on the quantity delivered to the Board during the previous crop year.

27. The price structure of both padi and rice was altered as from October 1, 1957. The prices of rice (per bag of 180 lb. gross) were as follows:-

Grade	Old Price
Extra Super	$ 18.80
Super	17.95
Extra No. 1	16.90
No. 1	16.00
No. 2	14.00
No. 3	12.00
Super Broken	8.40
Broken	7.20
Unclassified	6.30
White A	17.50
White B	14.00
White Broken	8.40

28. The minimum buying price of dry, clean and well winnowe padi rose from $6.00 to $6.80 per bag of 140 lb. net.

29. The selling prices of rice for export to the British West Indies having contracts with the Board were alter by agreement. Prices per bag of 180 lb. gross were as follows:-

Grade	Old Price
Super	$19.50
First quality	17.85
Second quality	16.05

Local selling prices varied from $17.90 per bag for Brown A to $7.20 per bag for stockfeed rice.

30. Exports of rice in 1957 fell to 38,163 tons valued at $9,166,610 compared with 41,371 tons valued at $9,855,654 in the previous year. The average price received rose by $1.97 to $240.20 per ton over that for 1956. Local sales and retention by growers amounted to 30,167 tons.

B.G. Rice Development Company

31. The Company continued to operate central mills at Mahaicony/Abary and Anna Regina. It purchased the following quantities of padi for the year:-

Mahaicony/Abary

(a)	From Company's cultivation	25,227 bags	(140 lb.net)
(b)	From farmers	142,237 "	net ea.

Anna Regina

From farmers	51,584	"
Total ..	219,048	bags

Machinery

32. Mechanisation of the rice industry continued to expand. Although farmers suffered a set back from the drought and were unable to meet their debts in full, there were no reported instances of creditors taking advantage of the situation. 344 tractors valued at $1,181,636 were imported compared with 252 tractors in the previous year. The importation of combine harvester-threshers rose from 16 in 1956 to 31 valued at $230,055.

33. Assistance was also given by the continued issue of duty-free petrol for rice cultivation and harvesting. Rice received greater assistance from this measure than any other agricultural pursuit as illustrated by the issue of 538,580 gallons to the rice industry out of a total issue for the year of 664,053 gallons. The balance was issued to the following industries: sugar received 116,502 gallons, ranching 2,240 gallons and miscellaneous industries 6,731 gallons.

34. Hire service of all types of machinery was continued by the Land Settlements, the Rice Producers' Association and the Government machinery pool. The crisis occasioned by the drought elicited a most generous response from all sections of the agricultural and industrial communities. Pumps were made available by the Sugar Producers' Association, Demerara Bauxite Company, Reynolds-Metals Company, Consolidated Goldfields, as well as by many private farmers, who all joined in helping one another out.

Pests and Diseases

35. There were outbreaks of the padi bug (Mormidea poecila), In Berbice and Demerara, but no serious losses were suffered. Blast (Piricularia oryzae) was suffered in certain sections of the Demerara River district and the Essequibo Islands, where a few areas of rice were completely lost.

Fertilizers

36. Several demonstrations of the effect of fertilizers on rice yields were carried out on farmers' holdings containing toxic soils. Considerable interest was shown in the increased yields obtained.

COCONUTS

37. There was little change recorded in the coconut industry during 1957. Apart from normal replacements little increased planting took place and the acreage under this crop remained relatively stable at 31,500 acres. The severe drought in the second half of the year had no adverse effect on production, and the palms not only stood up well but showed some benefit from the drying out of the soil.

38. Interest in copra manufacture was maintained and there was little need for artificial drying in the districts during the drought. There was much activity by small farmers who continued to produce sun dried copra under inefficient drying conditions.

39. Table VI shows the production of various coconut products in 1957 compared with 1955 and 1956.

TABLE VI

Year	Copra (tons)	Copra Meal (Lb.)	Edible Oil (Gins.)	Crude Oil (Gins.)	Soap (Lb.)	Margarine and Compound Lard (Lb.)
1955	6,114	4,393,951	777,853	241,078	4,123,150	240,249
1956	5,468	3,901,694	696,440	230,567	4,454,762	636,818
1957	5,370	3,814,412	676,731	147,339	4,777,727	1,642,230

Grading

40. Copra grading continued. Prices paid were:

Grade I - $282.80 per ton
Grade II - 271.60 per ton
Grade III - 260.40 per ton

The increased prices were effective from July.

Pests and Diseases

41. An outbreak of the locust (Tropidacris latreillei) occurr on an estimated 1,400 acres in the Corentyne, West Berbice Mahaica and Essequibo islands. Aerial spraying with dieldrin brough about control after much damage by defoliation.

42. Outbreaks of the Coconut caterpillar (Brassolis sophorae) causing defoliation were reported. The outbreak at Plants tion Park was particularly severe.

43. The Coconut Moth borer (Castnia daedalus) continued to be an insidious pest in the Mahaica-Mahaicony and other areas Improved cultural practices and the spraying of affected palms with a 1% Dieldrin solution is the recommended control.

44. A large number of coconut trees died from Bronze Leaf Wilt in poorly drained cultivation as a result of the dry conditions during the year.

COFFEE

45. Favourable prices of coffee continued during 1957, and production of Liberica coffee kept on increasing. Acreage increased in the North West District, but the Pomeroon farms were slowly recovering from the effects of the 1956 - 1957 flood. Export totalled 501,700 lb. valued at $315,917.

46. Sclerotium disease was significantly reduced during the year, on account of the dry weather conditions. Farmers of the North West District were greatly encouraged by this, and many of them increased their plantings.

CITRUS

47. Citrus cultivation was on the increase during 1957. Bumper crops were reaped, but prices were not favourable during the height of the season, and many fruit were left unpicked particularly in the North West District. There were no important outbreaks of pests and diseases; and the demand for budded citrus plants remained high. Farmers showed keener interest in maintaining a higher standard of husbandry.

Pests and Diseases

48. Brown rot of oranges (Phytophthora sp.) caused severe damage on one grove on the East Bank, Demerara, and was controlled by spraying with Perenox. Other diseases occurring were arthracnose, leaf spots and gummosis. Scale insects and aphids also occurred but effective control is possible by malathion and nicotine sprays.

49. Exports of lime oil and lime juice are shown in Table VII below.

TABLE VII

Year	Lime Juice		Lime Oil	
	Quantity (gln.)	Value	Quantity (lb.)	Value
1956	14,891	$12,658	1,179	$11,276
1957	17,191	$20,017	300	$ 3,142

FOOD CROPS

Roots and Plantains

50. The 1956 - 1957 flood exercised a very adverse effect on the production of these crops. Planting material became scarce and not only was replanting affected, but poor quality material was used, much of it diseased. A mid year attack of caterpillars tended to worsen the situation in the North West District, but it was quickly brought under control through prompt measures by the Department. At year end the situation was back to normal and cassava, in particular, was plentiful. Purchases by the Marketing Division totall 491,102 lbs. for the year.

Corn

51. Favourable weather conditions caused a bumper crop of corn to be reaped. Prices were kept up at a favourable level by the Marketing Division, consumers were encouraged to use local cornmeal.

Pests and Diseases

52. Panama, Moko and Leaf spot diseases remained prevalent and are distinct limitation to production. The Stem borer of plantains (Castnia licoides) occured in the Berbice River area. Fruit scanning by (Colaspis hypochlora) occured in many areas.

Maize

53. A severe outbreak of the army worm (Laphygma frugiperda) occurred in the North West District and was partly controlle by B.H.C. dusting.

ANIMAL HEALTH

Foot-and-Mouth Disease

54. The restrictions imposed on the Rupununi area in October 1956, on account of a fresh outbreak of the disease in the Rio Branco area of Brazil were relaxed in May 1957 and did not have to be re-imposed. The importation of animals from Brazil is

still forbidden as there is a risk of carrier animals bringing in the disease.

Paralytic Rabies

55. Numerous outbreaks occurred in the Rupununi and Intermediate savannahs and on the coast. Thirty cases were confirmed by the demonstration of Negri bodies in brain specimens. About 55,000 cattle were innoculated for prevention of the disease.

Poultry Disease

56. Preventive innoculation was used on a large scale to control Newcastle disease and Fowl pox. Outbreaks of Salmonella gallinarum, Fowl cholera, Infectious bronchitis, Coccidiosis and other poultry diseases added up to a high overall incidence of disease with poultry.

General

57. Inspection of livestock entering the colony continued as a means of preventing the introduction of diseases.

DAIRY INDUSTRY

58. The amount of milk purchased by the Milk Control Organisation and the Milk Pasteurisation Plant totalled 268,408 gallons valued at $218,001.18 compared with 255,840 gallons in 1956, an increase of 12,568 gallons. These figures do not, however, represent a complete picture of milk being supplied to Georgetown as the production of the lower East Coast, Demerara and the Bel Air dairies is excluded prior to the opening of the Milk Pasteurisation Plant in July.

59. The modern Milk Pasteurisation Plant at Kingston was opened on July, 26th and commenced operations thereafter, taking over the functions of the former Milk Control organisation. The Plant is a complete pasteurisation and bottling unit with its own cold storage facilities. Milk was purchased from farmers at an average of 72½¢ per gallon and sold wholesale at $1.08 per gallon in 1 pint bottles. The retail price was 16¢ per pint bottle. The consumer is now assured of a clean, safe, pasteurised fresh milk.

60. The Artificial Insemination Service continued to operate throughout the coastlands from Charity to Crabwood Creek as well as Bartica. A total of 2,275 services were carried out as compared with 2,266 in the previous year.

Imports of Milk Products

61. Table VIII records the position relative to 1956.

TABLE VIII

Product	1956		1957		% Increase or Decrease (in Quantity)
	Import (lb.)	Value	Import (lb.)	Value	
Condensed Milk (sweetened)	4,245,532	$1,102,826 £229,755.4	3,819,691	$1,099,988 £229,164.2	10.0 decr.
Evaporated Milk	4,787,748	$1,099,552 £229,073.3	5,569,403	$1,432,944 £298,530.0	16.3 incr.
Milk Powder	1,220,985	$ 685,553 £142,823.5	1,249,545	$ 881,179 £183,579.0	2.3 incr.
Total	10,254,265	$2,887,931 £601,652.2	10,638,639	$3,414,111 £711,273.2	3.7 incr.

BEEF

62. The major centres of beef production are the coastal ranch mainly limited liability companies and the Rupununi savann A limited supply comes from the Intermediate savannahs, where cattle rearing is made possible by the feeding of mineral supplements. Oxe and old cows augment the supply.

63. The most recent estimate of cattle population is 8,000 animals on the coastal ranches and 47,000 in the Interior Savannahs of the Rupununi. There are probably small increases since this estimate was made.

64. All cattle on the coast are delivered on the hoof to the abattoirs while the animals from the Rupununi savannahs are either sent to the market on the coast over the cattle trail or slaughtered at the Lethem Abattoir and the carcases flown to Georgetown.

65. A total of 21,620 head were slaughtered in the Colony during the year of which 8,939 were in Georgetown. 2,035 were slaughtered at Lethem and flown to the Georgetown market.

HIDES

66. The weight of hides exported was 350,391 lbs. valued at $31,521 an increase on the 1956 export of 18,298 lbs.

PIGS

67. The number of pigs slaughtered for the year was 14,749. Of these 6,840 were slaughtered at the Municipal Abattoir and 2,580 at the Ham and Bacon Factory of the Department of Agriculture.

68. A total of 84,664 lbs. valued at $43,640 was exported

SHEEP AND GOATS

69. Slaughtering of 597 sheep and 523 goats was recorded at the Georgetown Abattoir but there are numerous slaughterin in rural areas. The majority of sheep and goats for mutton graze untended on roadsides etc. Milch goats are reared on a limited scal

POULTRY

70. The broiler industry continued to expand, but egg producti was confined to smaller producers.

71. A total of 119,281 lbs. of killed or dressed poultry was imported valued at $84,687 as compared with 139,372 lbs. in 1956.

IMPORTS OF MEAT PRODUCTS

72. Table IX shows the quantities of meat products which still have to be imported.

BEEKEEPING

73. The dry year was favourable for beekeepers and during the dry months the blooming of honey producing trees was profu Beekeepers had no difficulty in maintaining production and the avera output per colony was 104 lb. The total number of beekeepers was 22 the majority operated one or two hives. A few beekeepers operate well over 100 colonies.

74. The estimated production of honey was 88,400 lb. of honey an increase of 3,400 lb. over the previous year. Producti of beeswax is estimated at 1,700 lb. and the value of both products $26,500.

TABLE IX

IMPORTS OF MEAT PRODUCTS

	1956		1957		% Increase or Decrease (in quantity)
	Quantity (lb.)	Value ($)	Quantity (lb.)	Value ($)	
Fresh, Chilled or Frozen					
Beef or veal	216,348	91,428	32,249	18,131	85.1 decr.
Mutton	95,756	46,465	61,244	34,574	36.0 decr.
Pork	571	314	-	-	100.0 decr.
Other kinds (including poultry)	155,173	104,008	143,727	96,118	7.4 decr.
Dried, Salted or smoked					
Beef or veal, pickled	1,146,550	385,251	1,055,891	413,846	7.9 decr.
Bacon & Ham *	271,108	269,420	236,071	232,279	12.9 decr.
Pork, pickled	1,112,875	377,037	798,700	291,398	28.2 decr.
Other kinds	2,357	1,048	285	240	87.9 decr.
Meat Preparations					
Sausages, all kinds	160,871	112,564	155,072	115,901	3.6 decr.
Other kinds (including meat paste	577,895	360,519	528,737	329,530	8.5 decr.
Total	3,739,504	1,748,054	3,011,976	1,532,017	19.5 decr.

* Include ham in airtight containers

75. The local market for honey was kept supplied throughout the year and there was also a ready market for beeswax. There was no export.

FISHERIES

Conditions

(a) Marine

76. Fishing on the broad shallow mud flats and further seawards provide the majority of fresh fish for local consumption. The principal method employed is the "Pin" seine and to a lesser extent cadell and handlines. Chinese seines are used in the estuaries of the rivers. The principal types of fish caught inshore are: queriman, catfish, snook, bangamaree, bashaw, crabs etc.

77. Deep sea fishing consisted of the trawling operations of the Research vessel "Cape St. Mary" and the four vessels of the British Guiana Fisheries and Trading Co. Ltd. as well as the hand lining from some dozen schooners for snapper and grouper 60 - 100 miles offshore. The trawling operations are comparatively new and are resulting in successful catches of sea-trout, croaker and bangamaree. The F.R.V. "Cape St. Mary" operated from C.D. & W. funds is carrying out a trawling survey for Government on the continental shelf from 10 - 100 fathoms offshore.

(b) Inland

78. The principal fishing areas are inland waterways, reservoirs, swamps, fish ponds and fields under flood fallow. Cast nets, gill nets, fence stop-off's and seines are the main methods of capture and pots and traps have been introduced with some success. Any estimate of production and other statistics are lacking as most of the fish is caught for home consumption by part time fishermen. The majority of fishermen do their fishing from the land but boats are used on the rivers and there are 32 registered fishermen with outboard engines.

79. The Department sponsored - programme for the culture of the exotic fish (Tilapia mossambica) in ponds, meets with some response and a total of 375 ponds ranging from 150 square yards to 5 acres now exist. 25,000 fingerlings from the hatchery in the Botanical Gardens and ponds at the Berbice and Essequibo district stations were distributed during the year. The Bookers Sugar Estates have shown considerable interest in the culture of Tilapia on their flood fallow fields but survival against predators is extremely poor. A yield of 625 lb. of fish from 0.65 acre was obtained from one pond.

Production

80. There were 981 registered owners of fishing boats engaged on coastal, estuarine and deep sea fishing. 185 "Chinese" seine boats are powered with outboard engines.

81. Deep sea launchings from the four trawlers of the British Guiana Fisheries & Trading Company and the Government trawler "Cape St. Mary" were 500,000 lbs. and 227,365 lbs. respectively.

82. Fish handled through the Municipal market totalled 6,357,765 lbs.

83. The wholesale fish market was officially opened on August, 1st 1957, but was in operation for the whole of the year.

84. Imports of fish and fish preparations totalled 5,283,530 lb valued at $1,944,144.

SECTION II.

WORK OF THE DEPARTMENT

A. THE EXTENSION SERVICES

85. The staff situation was fairly satisfactory. Five Instructors returned from the Eastern Caribbean Farm Institute, but due to others going on leave, no new sub-districts could be created. Two launches, the Oryza and Zea, were in service during the year in the larger rivers and these together with seven boats equipped with outboard motors in the smaller rivers, brought the extension services into the river areas on a greater scale than before.

EXTENSION METHODS

86. The methods used to contact farmers were essentially those used in most Extension Services. These may be classified as: Individual Methods, Group Methods and Mass Methods.

Individual Methods

(a) Farm Visits

87. By far the most important and effective technique, the field officer meets the farmer 'face to face' on his own farm and advises him on some improvement, invariably giving actual demonstration himself, e.g. pruning an orchard, controlling insect pests and the proper management of livestock, or the officer may offer the farmer at cost price (from stocks carried by him or available at his office), a new variety of seed, fertilizers, insecticides, veterinary drugs and literature, e.g. the Departmental leaflets and bulletins, or he may perform some service free of cost, e.g. treating a sick animal, castrating a bull, deworming a calf.

88. Farm visits were made also for investigating applications for loans, supervising the use of loans, enquiring into applications for duty-free petrol for use in agricultural machinery, securing information in connection with economic studies and enquiries from the Central Government. The field officer's visit to a farmer is associated therefore, more often than not, with some actual benefit to the farmer, either directly or indirectly.

89. During the year the staff reported a total of 25,651 visits compared with 28,353 in 1956. These were distributed as follows:-

Berbice	-	5,675
Demerara	-	13,886
Essequibo	-	4,752
North West District	-	1,338

(b) Interviews

90. The farmer often visits the Agricultural Officer at his home, office or demonstration office in search of advice and information. A total of 27,454 such interviews was recorded as follows, compared with 29,447 in 1956:-

Berbice	-	4,420
Demerara	-	15,389
Essequibo	-	6,499
North West District	-	1,166

(c) Telephone Calls and Letters

91. No record was kept of these. However, it should be stressed that a great deal of information passes between officers and farmers through these media.

Group Methods

92. Since the extension worker recognises that his effectiveness is greatly limited if confined to personal contacts with farm people, he tends to work increasingly through groups of rural people. This is particularly important in British Guiana, where there is in all a total of only 44 Extension Officers to cater for a rural population of over 300,000.

(a) Meetings

93. A total of 1,060 meetings was called or attended by the staff, compared with 956 in 1956, to discuss agricultural topics, introduce new ideas and organise self-help and co-operative schemes. These included meetings of Regional Development Committees and Area Sub-Committees.

(b) Field Days

94. These were designed for the purpose of method and result demonstrations and were most popular with farmers. Some were arranged also for school children. The locus of the Field Day was usually the Demonstration Station or Experimental Farm. The cost of lunches and of travelling expenses was met from Departmental funds. A total of 17 Field Days was held, compared with 13 in 1956.

(c) Training Courses

95. Local training courses for farmers were held in Plant Propagation, Beekeeping, Fishery, Dairy Husbandry, Pig Rearing and Poultry Management. 50 farmers attended from the various districts. In addition, 6 farm youths left for the United States of America to undergo "on-the-farm training" under the Young Farmer Training Programme of the International Co-operation Administration.

(d) Agricultural Apprenticeship Scheme

96. The Department continued the two-year Agricultural Apprenticeship Scheme. Eight apprentices completed their training and 4 new entrants were admitted.

Mass Methods

(a) Departmental Publications

97. Nine leaflets and bulletins were issued during the year on such subjects as control of froghoppers, padi-bug, and coushi ant, citrus, artificial insemination, poultry, fish and marketing.

(b) Government Information Services'

Bulletins and the Daily Newspaper

98. Very close and valuable co-operation was maintained with the Government Information Service and, through that Department, with the Daily Newspapers; Press Conferences attended by the Director, Departmental Officers and visiting experts were arranged. Full publicity was given to projects and even to educational material.

99. The newspapers co-operated by giving full 'coverage' to Field Days, Competitions and other efforts, and by publishing weekly a review of agricultural prices compiled by the Extension Service.

(c) Radio

100. The weekly radio programme was reduced from 15 minutes to 5 minutes. Nevertheless, several subjects of timely interest were introduced to the farming community, talks by officers and interviews with farmers being included at frequent intervals.

(d) Agricultural Shows and Exhibitions

101. The Department contributed exhibits of its work to the League of Coloured Peoples and the Indian Education Trust Exhibition in Georgetown. Similar contributions were made to exhibitions arranged by the Unions of Local Authorities in Berbice, East Demerara and the Essequibo Islands, as well as by Local Government in honour of its centenary celebration.

(e) Competitions

102. Crop and Livestock competitions were held in conjunction with the Exhibitions of the Unions of Local Authorities, at which officers of the Department acted as judges.

Other Media

103. The British Council provided film shows in the country on several agricultural subjects, by arrangement with District Officers and farm groups. Several films were also provided on loan by the United States Information Service.

Sale of Agricultural Requisites

104. The extension staff continued to supply farmers with various farm requisites, such as imported vegetable seeds, fertilizers, veterinary drugs and stock feeds. Stocks were kept at their offices and at District Demonstration Stations and many items were taken to farmers by Instructors in their knapsacks. Moreover, the Marketing Division from which these goods were obtained, made direct sales in Georgetown and New-Amsterdam and in the country via mail orders. Once the farmer was satisfied with their value, he frequently made his own arrangements for securing further supplies through normal commercial channels.

Pure Line Seed Padi

105. The staff were responsible for the sale to farmers of pure line seed padi produced under supervision of the Department at the Government Land Settlement Schemes at Anna Regina and Cane Grove.

106. The varieties distributed were No. 79, D. 110, 85/42 and 52/37, and total sales were as follows compared with total sales in 1956.

TABLE X

County	1956		1957		% Increase or Decrease
	Bags of 140 lb. net	Value $	Bags of 140 lb. net	Value $	
Berbice	1,387	10,045.06	1,083	8,682.32	22% Decr.
Demerara	4,265	35,786.01	4,916	42,886.63	15% Incr.
Essequibo	6,602	38,470.71	1,770	6,037.50*	73% Decr.
Total	12,254	84,301.78	7,769	57,606.45	36% Decr.

* Payment for 1,080 bags outstanding

106. In addition, farmers were encouraged to produce their own seed padi under a scheme operated in collaboration with the Rice Producers' Association. The following quantities were produced, bought subsequently by the Department and finally resold to farmers. The response was not as good as in the previous year as is illustrated in Table XI of sales below.

TABLE XI

County	1956		1957		% Increase or Decrease
	Bags of 140 lb. net	Value $	Bags of 140 lb. net	Value $	
Berbice	69	414.00	167	1,402.50	142% Incr.
Demerara	270	2,254.52	291	2,196.61	3% Incr
Total	339	2,668.52	458	3,599.11	32% Incr.

107. Pure-bred poultry and livestock produced at the Departmental Farm in Georgetown were distributed through the Extension Staff. Other supplies sold included economic plants, notably budded citrus and clonal cacao plants.

Co-operation with Government Departments and other Agencies

Regional Development Committees

108. A great deal of time was spent by officers in connection with operations of the Regional Development Committees and their Area Sub-Committees. The staff attended many meetings, investigated applications for loans and assisted in the preparation of community development and self-help schemes. It was estimated that at least a third of the time available to officers for official duty was spent in one way or another on the business of these Committees.

The Credit Corporation

109. Much of the work done by Regional Development Committees was connected with the activities of the Credit Corporation. The staff gave special attention to applications for large loans, referred direct by the Credit Corporation for examination and advice.

Machinery Hire Pools

110. Agricultural Superintendents served as Members of Area Committees concerned with the operation of the Machinery Hire Pools. The equipment of these pools, comprising bulldozers and draglines, were used on hire for clearing and draining new lands and reconditioning derelict estates. The main functions of the Committees were to determine priorities in view of the large number of requests from farmers and to settle disputes arising from the nature and quality of work done. The pumps of the Hire Pool were put into full and continuous use during the period of drought, in attempts all over the country to save as much of the rice crop as possible.

Inspection for duty-free petrol

111. The staff continued to be responsible for examining applications by farmers for 'duty-free' petrol for use in Agriculture. The quantity of petrol issued free of duty is given in Table XII below.

TABLE XII

	1956	1957
Rice	402,185 glns.	538,580 glns.
Sugar	129,804 " *	116,302 "
Ranching	3,730 "	2,240 "
Other	6,615 "	6,731 "
Total	542,334 glns.	664,053 glns.

* Issued direct to sugar plantation on the drawback system.

Drainage and Irrigation Department

Crop Valuation

112. The work of crop valuation in the Boerasirie Extension Project continued under the crop valuator, whose valuations were used by the Drainage and Irrigation Department for the award of compensation to farmers. Crop valuation was also commenced on the Black Bush Polder towards the end of the year. Ad hoc enquiries from other Departments for valuation of crops were dealt with by the staff, chief among these being estimates carried out along the Georgetown-Rosignal road and railway in connection with the construction of the new road and the rural electrification scheme.

113. A new Land Acquisition Ordinance was introduced during the year. The main feature of the Ordinance provided that land compulsorily acquired by Government would no longer be valued according to the prevailing market values, but would be given that capital value which yielded at six per cent interest the calculated annual net income produced or capable of production by the land. One estate was valued under this Ordinance at Black Bush Polder.

Local Authorities

114. The staff maintained the usual close contact with Local Authorities. Officers and Instructors attended meetings and reported on agricultural conditions, gave talks on measures for improving agriculture and advertised new Departmental projects. Local Authorities permitted Instructors to use their offices for interviewing farmers and cooperated in supplying data for agricultural surveys and censuses.

115. Special assistance was given to Community Projects in East Demerara and Berbice in the two villages of Golden Grove-Mabaolis and Crabwood Creek, and a new Project initiated at Huis t' Dieren in Essequibo.

The Peasant Sugar-Cane Farming Industry

116. An Agricultural Instructor continued to be specially assigned to the peasant sugar-cane farming industry on the East Coast of Demerara. A slight increase of 83 acres was granted to farmers, chiefly in order to allow them to utilise small plots of land between their cultivation which would assist them in flood fallowing. 2628 tons of sugar valued at $310,170 were produced compared with 2,878 tons valued at $317,036 in 1956.

117. The Extension programme was directed towards encouraging block-planting, block-harvesting, delivery of clean canes to the mills, controlling the frog-hopper pest, distribution of planting material of high yielding varieties resistant to Leaf Scald disease, flood fallowing of fields, application of fertilizers and improving field practices.

Pests

118. The Frog-hopper pest was not evident during the year on account of the dry weather. Rats attacked newly planted cane but were quickly brought under control.

Distribution of Planting Material

119. The use of newly improved varieties was on the increase. 37½ tons of planting material, valued at $1,204.20 were purchased, compared with 15½ tons valued at $90.35 in 1956. Farmers were encouraged to establish their own nurseries.

Fertilizers

120. Fertilizers used were 3,935 cwt. valued $24,928 compared with 4,664 cwt. valued $32,432 in 1956.

Flood Fallow

121. Drought conditions prevented flood fallowing on an increased scale. Only 36 acres were flood-fallowed compared with 58 acres in 1956.

Improved Standards of Cultivation

122. The most important method used to educate farmers in improving their system of cultivation was advice on the spot by the Instructor. In addition, a competition was held between villages for the highest general standard of efficiency; Plaisance succeeded in winning the Malcolm Laing Cup for the fifth year in succession. A Field Day was held for cane farmers, of whom 25 attended, at the Sugar Experimental Station. They were given lectures and demonstrations on the improved practices of sugar cane cultivation.

Work of Committees

123. The Price-fixing Committee for farmers' canes continued to function. The Agricultural Chemist, the Chairman, made periodic tests of samples of juice taken by him at factories. Prices fixed by the Chairman ranged from $10.30 to $9.25.

124. The Central Cane Farmers' Committee met on several occasions and considered a wide range of matters affecting the Industry. The Agricultural Superintendent and Cane Farming Officer worked closely with this Committee.

BEEKEEPING

125. 328 visits were paid to beekeepers and many demonstrations to prospective beekeepers and schools were given. Seven persons received a 4 day course at the Botanical Gardens apiary. Exhibits were shown at 6 exhibitions and farms. The Botanical Gardens apiary was maintained and a total of 187 queens were produced. 122 were sold or distributed as queens and 49 with nuclei of bees. 8 nuclei were given free to schools.

126. The Beekeepers' Association celebrated its Silver Jubilee convention and the Department continued to give its full support to the organisation.

AGRICULTURAL EDUCATION AND INFORMATION

School Gardens

127. Work in school gardens was mainly directed towards maintenance of standards and the continuation of projects started in previous years. Maintenance grants were made to 61 schools ; and special grants for building fences and purchasing tools to 27 schools.

129. There was an increase of 20 school gardens during the year, bringing up the total to 99 for the Colony. These were distributed as follows: 34 in Berbice, 48 in Demerara and 17 in Essequibo. Competitions were held in the three counties, the schools competing for individual prizes on a district basis and for the Bannister Shield on a Colony basis. School gardening certificates were also awarded on a year round assessment.

130. Three Field Days for school children were held, one in each county, on the actual school-gardens, where the Demonstrations were carried out by the school children themselves under the guidance of their gardening teachers. An "Open-Day" for parents and visitors was held at one school garden in West Demerara. Field trips were arranged for pupils of two schools.

131. Fish culture, beekeeping and poultry rearing were other projects established in some of the more interested schools. At the end of the year there were 24 apiaries, 16 fish ponds and 4 poultry projects in operation.

Radio

132. After the first four months of the year the 15 minute radio programme "Spotlight on Farming" was taken off the air, and in its place was substituted a 5 minute programme "Farmers Notebook" which was included within the programme of the Government Information Services.

Publications

133. Nine publications were produced as follows:-

1. "Kill Froghoppers"
2. "Two causes of low rice yields and what you do about them"
3. "A simple method of controlling the padi bug"
4. "The Poultry battery laying cage"
5. "Fish Trawler"
6. "Starting a Citrus Orchard"
7. "Coushi Ant Control"
8. "Artificial Insemination"
9. "The Marketing Division"

News Releases

134. 81 news releases were submitted to the press through the Government Information Services.

Audio-visual Aids

135. Diagrams, illustrations, posters and signs were prepared for agricultural shows and distribution. Two chalk-boards with easels and a linen film screen, were acquired for teaching. The Photography Section served the specialists and extension divisions by processing films and preparing prints needed for reports.

RURAL YOUTH TRAINING

136. The staffing of the Rural Youth Division was completed by the recruitment of one Instructor towards the end of the year. One training conference for Instructors was held at Headquarters, and four training meetings for members in the districts. One Community Survey was carried out in Essequibo with a view to establishing a club.

Project Material

137. Five new leaflets in home economics were prepared. Pattern drafting was taught, and the use of commercial patterns introduced.

Exhibitions

138. Members gave demonstrations and prepared exhibits for seven exhibitions held in the various districts. Two 4-H Exhibitions were held in Essequibo.

Membership

139. At the end of the year there were 22 4-H clubs with a membership of 1,188 compared with 18 clubs with a membership of 1,111 in 1956, and 9 Young Farmers Clubs with a membership of 234 compared with 6 clubs with a membership of 227 in 1956. These are shown in Table XIII.

TABLE XIII

District	No. 4-H Clubs	Membership		No. Local Leaders for 4-H Clubs		No. Y.F. Clubs	Membership	
		Boys	Girls	Men	Women		Y.Men	Y.Women
Demerara	11	205	407	13	25	3	33	14
Essequibo	5	113	153	9	9	3	25	60
Berbice	3	81	109	15	7	3	46	56
Bartica	3	40	80	8	3	-	-	-
Total	22	439	749	45	44	9	104	130

Project Work

140. The project work of club members can be classified into 4 sub-divisions:-

(a) Agricultural projects concerned with poultry, vegetable garden, dairying, the rearing of goats, sheep and pigs, citrus and coffee growing and the keeping of bees. The most popular project work is that of poultry, followed by vegetable gardening, the rearing of pigs and dairying. There were 365 projects in operation compared with 237 in 1956.

(b) Food and Nutrition projects in which the food value of the common foods is taught together with methods of preparing and cooking. There were 402 projects in operation compared with 343 in 1956.

(c) Clothing projects where members are taught to design and make items for the home as well as wearing apparel. There were 407 projects in operation compared with 471 in 1956.

(d) Home Improvement projects where members make articles for the home both for utilitarian and beautification purposes. There were 238 projects in operation compared with 137 in 1956.

141. During the year, Instructors gave 520 demonstrations, interviewed 1,864 persons and visited 4,420 farms and homes.

AGRICULTURAL DEMONSTRATION STATIONS AND STUD UNITS

142. Agricultural Demonstration Stations and stud units were maintained and supervised by Senior Extension Officers in the larger districts as an integral part of the Agricultural Extension Programme. The main functions of these stations were to provide farmers with some or all of the following facilities:-

(a) A depot for the purchase of certain agricultural and veterinary supplies.

(b) Seed multiplication and distribution.

(c) Observation and demonstration of new varieties and methods

(d) Stud unit for improving the breed of livestock

(e) A meeting place and advisory centre.

143. Farmers continued to take full advantage of these services. The following is an account of the work done on these stations.

Demerara - Paradise Station

144. Demonstration plots of suitable fodder grasses, vegetable and legumes were maintained and planting material was sold or distributed free to farmers in the following amounts: 57 lb. seed, 1,818 packets of seed and varying amounts of peas and beans, cucumber, egg plant, ocuro, tomato, onions, mint, thyme, sweet potatoes, fodder grasses and legumes. This Station was closed down in April, as a consequence of the opening of the Central Agricultural Station at Mon Repos.

Berbice - No. 63 and Whim Stations

145. Apart from their demonstration value, these stations have served as the main sources of planting material of certain crops for distribution to farmers in the country. Thus, No. 63 was the principal supplier of citrus plants whereas Whim supplied grasses and fodder plants.

146. The following table shows the quantities of planting material sold from the 2 stations and the New Amsterdam Office:-

	1936	1937
Vegetable Seeds	4,000 pkts.	3,595 pkts. 77 lbs.
Citrus plants	1,100 plants	573
Vegetable seedlings	-	3,000

147. The following studs were kept at the stations: 1 bull and 1 boar at No. 63, 1 bull 2 boars, 1 Jack and 1 ram at Whim. The bulls were removed after the introduction of artificial insemination. The boar at No. 63 was sold for slaughter, and the Jack was transferred to the New Amsterdam Prison Farm. The services for the year were 6 by the bulls, 11 by the boars, 3 by the Jack and 3 by the ram.

148. Two cows were maintained at Whim to demonstrate the soiling system and improved methods of husbandry. Milk yield was 7,431 pints compared with 8,842 pints in 1936.

149. A Deep Litter unit was established at Whim to house 74 three-week old chicks. At 12 weeks old the stock was sold to farmers, 12 being retained for demonstration in a battery unit.

Essequibo - Suddie, Maria's Lodge

Charity and La Belle Alliance

150. The Suddie and Maria's Lodge nurseries distributed 1,484 and 3,536 budded citrus plants respectively during the year, and the Charity nursery 1,534 coffee seedlings. The latter nursery lost nearly 4,000 seedlings by floods in the early part of the year.

151. The cacao propagating unit at La Belle Alliance was supplied with an overhead water tank and pump, and water pipes were installed to the bins. Rooted cuttings of five clones were sent from Georgetown, which, after setting and hardening were planted out in the field. A citrus block of 370 citrus trees was established in an adjoining section, for the purpose of supplying budwood for the citrus nurseries.

152. The vegetable demonstration plot at Maria's Lodge produced 2,134 lbs. of vegetables which were sold to the Public Hospital.

Mazaruni-Potaro

153. The citrus demonstration cultivation was maintained and produced 13,617 fruit. A fertilizer trial was laid down with the object of arresting the decline noticed last year and to prolong the bearing life of the trees. 183 budded citrus plants were sold from the station.

154. The pens of poultry and turkeys were sold in order to introduce a scheme of rearing one-day old chicks and selling them at three weeks.

155. Four cows were kept for demonstration purposes, 12,794 pints of milk were produced.

North West District - Hosororo
Agricultural Station

156. This is the largest station attached to the Extension Service and its activities were maintained and intensified. The programme of work included general maintenance work, field trials, investigations with crops and livestock, production of breeding stock and planting material, Field Days and demonstrations.

Citrus

157. The orchard was maintained in good condition. An exceptionally heavy crop was in bearing at year end. The demand for budded citrus plants was at a high level, and 1,277 plants were distributed from the station.

Cacao

158. The cacao trial plots on the hill slopes continued to perform satisfactorily. Yield of beans was 1,400 lb. compared with 1,157 lb. in 1956.

159. The new 5-acre nursery was planted up with six clones, 4,019 clonal plants were propagated, of which 200 were sold to farmers, most of the remainder being used to plant up new nurseries.

Coffee

160. The Robusta type proved completely unsuitable to swamp conditions, and the plot was abandoned. The Liberica plot made little progress on the swamp, despite regular attention.

Avocado Pear

161. The old cultivation was rested in order to give it the opportunity of putting on good vegetative growth. The new section made good progress.

Coconut

162. The plot of coconuts, consisting of the local tall and St. Lucia dwarf varieties, appeared retarded in growth during the year. This crop on the whole does not appear suited to the conditions of the North West District.

Cashew

163. The cashew orchard was maintained. The condition of the trees deteriorated on account of the rocky nature of the soil in which they were planted. Bearing was irregular and a very small crop was harvested.

Cotton

164. Further work on this crop has been abandoned.

Ginger

165. A plot of ginger on the exhausted pegasse yielded at the rate of 3,000 lb. per acre. This crop proved to be well adapted to conditions of the district, and production on farms was on the increase.

Grasses

166. Locuntu and Para grasses performed well on the exhausted pegasse soils with fertiliser applications producing yields in the vicinity of 10 to 15 tons per acre per cutting.

Economic Nurseries

167. Propagation and distribution of planting material continued. The nursery on the swamp proved satisfactory. The increased demand for planting material was fully satisfied. Chiefly distributed were citrus, cashew, cacao, avocado, nutmeg, blackpepper, castor bean, plantain and banana suckers, cassava, vegetable seeds, seedlings and cuttings.

168. In addition to the regular sale of plants, there was some free distribution. Farmers, Government compounds, Indian Settlements, Missions, all benefited from gifts of plants, seeds, suckers, cassava sticks, budwood etc.

169. Another function of the nurseries was the collection and distribution of seeds, seedlings, budwood, fern roots, moss, etc. to other divisions and districts.

Vegetable Garden

170. The demonstration vegetable garden was maintained throughout the year. Chiefly grown were peas and beans and the hardier leaf and fruit vegetables.

Pegasse Trials

171. Trials on the worn out pegasse soils in the swamp area consisted of two grass experiments, corn and rice fertilizer trials, and observation plots of turmeric and ginger.

Cattle

172. A herd of 1 breeding bull and 5 cows was maintained. Four calves were born during the year, one of which was sold to a local farmer. Milk production for the year was 14,302 pints.

173. The cattle were used for demonstration and breeding purposes. They utilised un-marketable produce, supplied manure and permitted observations on types suited to the district. The demonstration value of these animals has been substantial in the North West District where cattle are scarce.

Donkey

174. This animal maintained excellent condition. His use as a pack animal served as an incentive to hill farmers, one of whose difficulties has always been transportation.

Poultry

175. The flock kept for the production of hatching eggs was disposed of and chicks from Georgetown were reared for distribution at three weeks.

DEVELOPMENT SCHEMES

Staff Training

176. Four cadets and one serving Agricultural Instructor completed a one year course at the Eastern Caribbean Farm Institute in July.

177. Five students were sent in October to commence a two-year course.

CACAO DEVELOPMENT SCHEME

178. Colonial Development and Welfare assistance was approved up to the end of the year on the basis of a 50% contribution. The propagation centres at Atkinson Field (Demerara) Providence (Berbice), Hosororo (North West District), Belle Alliance (Essequibo), and in the Botanic Gardens continued to operate.

Atkinson Field

179. A new open spray unit was built, containing four bins with a total capacity of 2,000 cuttings per month. New Nurseries totalling 6 acres were established in the field. 37,300 cuttings were propagated, 26,369 plants basketed, 21,191 distributed and at year end there were 12,941 plants on the hardening floor.

Botanic Gardens

180. This unit served an important role in supplying plants for the out-stations establishing their own nurseries. 5,375 cuttings were propagated, 5,167 plants basketed, 7,791 plants distributed, and at year end there were 490 plants on the hardening floor.

Essequibo.

181. An overhead water tank and a new store room were erected. Three acres of new nursery were planted to shade and clonal plants.

Hosororo

182. An overhead tank was erected, and five acres of new nursery were replanted to shade and clonal plants. 6,101 cuttings were propagated, 4,019 plants basketed, 200 plants distributed, and at year end there were 4,700 plants on the hardening floor.

Providence

183. An overhead tank was erected. 13,344 cuttings were propagated, 12,600 plants basketed, 1,800 plants distributed, and at year end there were 11,205 plants on the hardening floor.

B. RESEARCH AND EXPERIMENTATION

(i) Financed from Local Funds

183. Agricultural Research in the Colony is carried out by the specialist and other officers of the Department of Agriculture, the Sugar Experiment Station staff and Bookers Sugar Estates Ltd. The B.G. Rice Development Company continued to work on problems in connection with all aspects of the mechanisation of rice cultivation, and the Berbice Fibre Research Company continued its efforts to determine whether jute could be produced economically under local conditions.

SUGAR-CANE

General

184. The research work of the Sugar Experiment Station is fully reported each year in the Annual Sugar Bulletin. The main line of work is varietal testing, but cultivation and fertilizer experiments are also carried out. In addition to the work of the Sugar Station, Bookers Sugar Estates Ltd. have set up their own research organisation. The work of this organisation is generally made available to the industry through the Sugar-Cane Research Sub-Committee and, on a wider scale, at West Indian Sugar Conferences.

Variety Testing

185. The main commercial varieties B.41227 & B.37161 continued to perform well in a notably dry year. The mean Pol. % Cane over all plant, 1st and 2nd ratoon trials so far carried out on these varieties is 12.83 and 12.78 respectively.

186. Varietal experiments reaped in 1957 confirm the high yielding ability of B.49119 and B.47258. B.49119 cannot be recommended for commercial planting because of its susceptibility to Leaf Scale disease. B.47258 is recommended for commercial extension as it gives yields equal to the standard canes on pegasse and clay soil types and ratoons well. Juice is of average quality and the variety has a tolerant leaf scald rating. It is susceptible to rat damage.

187. The Demerara varieties D.49/46 and D.141/46 are recommended for trial on a small scale commercially but are primarily autumn crop canes. B.45137 is a hardy cane that ratoons well and may be of value on clay areas where yields are normally low. B.43413 has been a consistent performer against the standard on clays and is recommended for limited expansion.

188. None of the 1950 and 1951 Barbados series have yet shown outstanding promise, B.50135, B.51116 and B.51131 are the best.

189. The raising of seedlings from "fuzz" bred in Barbados and from crosses made in British Guiana continued. It is too early to report on these seedlings.

190. Trials with directly imported canes have been disappointing and no rivals to the standard canes have yet been discovered.

THE MORE OUTSTANDING VARIETIES COMPARED WITH B.41227

Variety	No. of Comparisons			Available Pol. per acre Index (B.41227 - 100)			Tons available Pol. per acre (B.41227 - 100)			Available Pol. % cane Index (B. 41227 - 100)
	P.	1 R.	2 R.	P.	1 R.	2 R.	P.	1R.	2 R.	Mean All Cycles
B.49119	13	7	2	103	112	113	6.56	5.90	5.33	100
D.141/46	12	12	7	104	113	111	6.62	5.96	5.24	103
B.47258	21	17	9	103	107	100	6.56	5.64	4.72	102
B.41227	-	-	-	100	100	100	6.37	5.27	4.72	100
D.49/46	15	15	12	89	106	106	5.67	5.58	4.99	96
B.43413	14	13	10	96	95	104	[illegible]	5.[illegible]	4.91	98
D.37/45	18	18	17	93	100	101	5.92	5.27	4.77	101
B. 45137	17	16	11	93	98	103	5.92	5.16	4.86	97
B.47419	11	7	3	94	92	97	5.99	4.85	4.58	98
B.37161	42	38	29	91	95	94	5.80	5.01	4.44	100
D.158/41	12	10	10	98	90	91	6.24	4.74	4.30	93
D. 4362	15	15	14	93	95	93	5.92	5.01	4.39	108
B.46378	18	18	18	94	89	95	5.99	4.69	4.48	97
D 58/43	6	6	6	92	91	92	5.86	4.80	4.34	92
D 4/43	12	11	10	93	93	88	5.92	4.90	4.15	94
B.47225	18	17	12	95	90	82	6.05	4.74	3.87	101
B. 4098	17	15	14	96	88	82	6.13	4.64	3.87	102
Pindar	20	14	1	89	88	90	5.67	4.64	4.25	101
D 54/43	10	10	10	88	90	87	5.61	4.74	4.11	90
B.46351	15	14	14	87	92	85	5.54	4.85	4.01	96
B.4995	10	9	5	92	87	84	5.86	4.58	3.96	102
B.4942	11	10	8	94	86	81	5.99	4.53	3.82	105
B.4744	13	13	11	86	92	81	5.48	4.85	3.82	98
B.43153	10	10	8	88	86	80	5.61	4.53	3.78	107
B.47379	11	9	4	87	87	78	5.54	4.58	3.68	89
B.3410[illegible]	35	19	16	86	81	83	5.48	4.27	3.92	98

Leaf Scald Research

191. Research on this disease, which is a major factor in the sugar industry continued although the tripartite C.D. & W., Sugar Producers' Association and Government financed scheme came to an end in 1956. The Plant Pathologist of the Department continued with the routine rating of newly bred and introduced varieties at the Sugar Experiment Station. It is clear that the industry must be based on varieties which are classified as at least susceptible-tolerant to the disease in view of the quick infection of B.49119 which has occurred as soon as moderate extension was attempted. Histopathological studies were commenced, but too few specimens have been examined for conclusions to be drawn. The future work on the disease is to be concerned with the methods of spread of the disease, its histopathology and other problems.

Insect Pests

192. The sugar-cane froghopper, (Aeneolamia flavilatera) was kept under control by dusting with Benzene hexachloride. The moth borers continued to be a pest of economic importance particularly (Diatraea canella)

RICE

Introduction and Breeding

193. The breeding programme continued at the Central Agricultural Station for the spring and autumn harvests. A total of 259 imported varieties were grown in small observation and maintenance plots and 10 varieties from Burma and India for yield testing. A total of 16,675 selections were grown, the generations ranging from F_4 to F_{13} including recurrent crosses. Seven lattice square and nine randomised block experiments were carried out on the more promising selections which had become homozygous and records were kept of flowering date, shattering, grain type, resistance to lodging and yields. The local variety No. 79 was used as the standard for comparison and it is evident that some very promising varieties are suited for mechanical harvesting; some of these are already being bulked for farmers' trials.

194. Three of the new varieties were grown on cambered beds of over half an acre each on the Central Agricultural Station and two more at the Mahaicony Abary Rice Development Scheme. Yields of over 30 bags (140 lb.) paddy per acre were obtained at Central Agricultural Station but were poor at Mahaicony Abary Rice Development Scheme.

195. The criteria which are being used in the selection of new varieties are primarily resistance to lodging, grain length medium or long, yield exceeding No. 79 without fertilizer and preferably with a larger fertilizer response and resistance to shattering. Other factors are the selection of varieties for maturation period to extend the harvesting period now confined to a few weeks on the existing photoperiodic varieties. In this respect if non-photoperiodic types are founded they will be carefully retained. Disease resistance to the leaf spot (Helminthosporium oryzae) and blast (Piricularia oryzae) is also taken into account, but these diseases are not prevalent in the main rice growing areas. The selection of a short grained rice would be made only if the yield exceeded No. 79 by a considerable margin.

Amongst the imported varieties three from Burma and one from India gave yields of over 4,000 lb. per acre, rather higher than No. 79 but with similar length of time to flowering. In the lattice and randomised block experiments on the local selections there are about 15 varieties already being bulked which appear to combine the characters of upright non-lodging habit, resistance to shattering, suitable grain type and yield equal or better than the standard No. 79. It is clear that No. 79 sets a high standard and that it is no simple matter to breed a variety that is its equal in yielding capacity. Nevertheless one of these varieties has outyielded it consistently by an average of over 800 lb. per acre.

196. It is emphasised that no new selections have passed the final stages of testing and the results of farmers' trials involving large fields to be harvested on a commercial scale are awaited before distribution of seed will be made on a commercial basis. Many selections in an earlier stage of testing show more promise than the first selections to be bulked and it is to be expected that the first releases of the rice breeding programme will be replaced fairly quickly.

Fertilizer Investigations on Rice

197. A number of fertilizer trials were carried out at the Cane Grove and Vergenoegen Land Settlements and on the Central Agricultural Station. One 3^3 factorial trial on toxic soil at Cane Grove harvested for the fourth time showed, as before, large response to phosphate. There was however no obvious response to the 2 tons and 4 tons of limestone per acre applied in 1954. Irrigation water was short in the latter stages of the crop.

198. Yields in bags of 140 lb. nett/acre as compared with 1956

	1956	1957		1956	1957		1956	1957
N_o	10.3	11.6	P_o	8.1	7.7	L_o	10.8	11.2
N_1	11.0	11.4	P_1	12.5	11.5	L_1	11.4	10.3
N_2	13.1	9.5	P_2	13.6	13.5	L_2	12.1	11.2

N_1 = 1 cwt./acre sulphate of Ammonia

N_2 = 2 cwt./acre sulphate of Ammonia

P_1 = 1 cwt./acre triple superphosphate

P_2 = 2 cwt./acre triple superphosphate

L_1 = 2 tons/acre ground limestone in 1954

L_2 = 4 tons/acre ground limestone

Another 3^3 trial on a pegassy-clay toxic soil at Cane Grove showed a high response to Phosphate little response to nitrogen and no response to sodium chloride:-

199. Yields in bags of 140 lb. nett/acre

No	17.39	Po	15.92	NaO	17.86
N_1	17.50	P_1	18.64	Na_1	18.10
N_2	18.25	P_2	18.78	Na_2	17.16

(N & Px rates of application as in trial above)

Na_1 = 1 cwt. NaCl per acre

Na_2 = 2 cwt. NaCl per acre

200. Yields on this trial were much better than the 9-10 bags per acre yields obtained in 1956. One 3^3 factorial and one 3 x 5 randomised block trial were conducted at Cane Grove on clay soils which normally give poor yields. There was a marked response to phosphate, no response to nitrogen and a small response to lime in the factorial and yields were markedly greater than in the previous year.

No.	17.62	Po	15.36	Lo	16.24
N_1	17.32	P_1	18.71	L_1	17.92
N_2	17.38	P_2	18.22	L_2	18.13

(Fertiliser applications identical with the first experiment reported).

201. In the 3 x 5 randomised block there was a definite response to fertilizer when phosphate was included and little response when excluded. The experiment was outstanding in the urea.

202. The same design of experiment with the same treatments was laid down at the Central Agricultural Station on a very fertile soil and all yields were high but there was little difference between treatments.

Yields in bags of 140 lb. nett/acre

	Cane Grove	C.A.S.
No fertilizer	12.78	26.22
1 cwt./acre ammophos	14.92	26.30
2 cwt./acre ammophos	15.75	26.83
1 cwt./acre NP mixture (1 part SA: 1 part T.S.P.) ..	15.46	26.99
2 cwt./acre NP mixture (1 part SA: 1 part T.S.P.)..	16.59	27.02
1 cwt./acre sulphate of ammonia ..	13.64	26.38
½ cwt./acre urea	13.38	25.52
½ cwt./acre urea + ½ cwt. T.S.P. ..	15.46	26.7

203. A 3^3 factorial at the Central Agricultural Station of fertile clay showed a good response to phosphate a small response to nitrogen and no response to lime.

Yields in bags of 140 lb. per acre

No	19.21	Po	16.87	Lo	20.37
N_1	18.84	P_1	21.23	L_1	18.75
N_2	21.10	P_2	21.04	L_2	20.02

L_1	=	½ ton limestone per acre
L_2	=	1 ton limestone per acre
N_1	=	½ cwt. ammonium chloride per acre
N_2	=	½ cwt sulphate ammonia per acre
P_1	=	½ cwt. triple superphosphate per acre
P_2	=	1 cwt. triple superphosphate per acre

204. A 3^3 N.P.L. trial at the Vergenoegen Land Settlement was severely affected by dry weather and gave small responses to nitrogen phosphate and lime only.

Insect Pests

205. There were outbreaks of the padi bug (Solubea poecila) and Berbice, Mahaica and Leguan and a few minor outbreaks of the rice caterpillar (Laphygma frugiperda).

Rice Stem Borer Investigations 1955 - 1957

206. The main stem borers infesting rice are (Diatrae saccharalis) and (Rupela albunella). They were suspected of causing a considerable and insidious loss of paddy but the investigations have indicated that the population of Diatraea is low and that damage is reduced by by the onset of diapause. Rupela is common, particularly in transplanted rice but numbers fluctuate from year to year. Damage does not appear to be appreciable owing to the inability of the borer to feed on the harder tissues of the stem.

207. The life histories of both of these pests were studied and both originate in the riparian grass communities. Diatraea is well controlled by the Amazon fly (Metagonistylum minense) and there are also parasites of Rupela.

208. The damage caused by the pests is evidently, not as serious as was thought.

Rice Storage Investigations

209. The investigations commenced in 1955 were continued and a comprehensive report by the Entomologist-in-Charge was issued in July when he went on leave.

210. Under local conditions, the most important insects attacking both padi and rice are Calandra oryzae (L), Rhizopertha dominica (Fabr.) and Sititroga cerealella (Oliv.). Preliminary results indicate that the damage caused by Calandra and Rhizopertha alone in padi may result in a monetary loss to the industry of over $400,000 per annum with an annual production of 1,920,000 bags of padi.

211. Advice on storage was given to the Mahaicony/Abary Rice Development Scheme and to the Rice Marketing Board on their storage problems. Plans for simple bin storage and the use of Flintkote floors for bonds were also put forward.

212. Methods of moisture testing received considerable attention as moisture content of grain is the most important single factor in grain storage. Drying systems were studied. The proper method of stacking grain and the arrangement of stacks within the bonds makes possible a more efficient use of insecticides.

213. Fundamental studies on the life history, increase and control of the more important insect pests were made.

CITRUS

214. A fertilizer trial was commenced at Bush Lot in Berbice using dressings of Lime, sulphate of ammonia, triple superphosphate and muriate of potash. The trial will continue for 2 years with dressings of N.P.K. every six months.

COCONUTS

215. Observation trials on the fertilizing of coconuts have shown favourable responses to lime and a complete N.P.K. mixture. One proprietor has limed his entire cultivation of 1,300 acres as a result and has started using an N.P.K. mixture. Fertilizers have assisted in prolonging the life of trees in the Pomeroon river district which is, however, unsuited for coconut cultivation.

Pest and Diseases

Coconut Moth borer

216. The existing knowledge about this insidious pest was reviewed and its life history and habits studied with a view to finding effective control measures. The growth of bush on unweeded estates encourages the pest and this may be related to humidity conditions in some way.

217. The main achievement of the present investigations has been the successful use of dieldrin in reaching the insect in its borings but there is more work required on methods and strength of application and a combination of borer control and fertiliser application coupled with the good crop husbandry.

Locusts

218. A major outbreak of the locust (Tropidacris latreillei) was controlled with Dieldrin spray using 4 fl. ozs. 18% Emulsion Concentrate to 1 gallon water at the rate of 20 gls. per acre. Dieldrin was more effective than Aldrin and Gammexane.

Coccids

219. Tree resting ants (Azecta sp.) fostering heavy infestation of the coccids (Aspidiotus destructor) and (Ischnaspis longinostris) were controlled by spraying the nests with a 0.9% Chlordane solution, 0.3% Aldrin solution and 0.2% Dieldrin solution. Good results were also obtained by banding the tree with a P/o Dieldrin emulsion 4 ft. from the ground.

EXPERIMENTS ON PEGASSE SOIL

North West District - Hosororo Station

220. Trials were continued on the pegasse soils of the riverain strip of the station which are high in exchangeable aluminium and water soluble sulphates. The soils occur commonly throughout the district and lose fertility rapidly after being cleared from the bush and cropped for a short period.

221. The approach to the problem has been to search for crops which are tolerant to the toxic condition and to try and counteract the decline in fertility by the use of fertilizers and lime.

222. Suitable crops so far discovered are ginger which gave yields of up to 4,480 lb. roots per acre with a complete fertilizer and cowpeas which grew vigorously.

223. Para grass (Brachiaria mutica) and Locuntu grass (Ischaemum timorense) have given good yields with fertilizer application. There is every indication that the rearing of cattle on the river lands can be based on these grasses.

224. Maize and rice were grown in fertilizer trials. The yields of maize were low and it is clear that this crop cannot be grown regularly on the pegasse. Yields of up to 18 bags paddy (140 lb. each) per acre were obtained where phosphate and lime were applied and there appear to be possibilities for rice where there is a suitable supply of irrigation water. There was a marked positive response to lime and phosphate and a marked negative response to nitrogen.

225. In view of the negative response to nitrogen only the responses of lime and phosphate are given in the absence of nitrogen.

	No. P.	½ cwt. T.S.P.	1 cwt. T.S.P.
Trial No. 1	7.3	10.2	7.0
Trial No. 2	13.3	14.2	15.1

	No Lime	½ ton Lime	1 ton Lime
Trial No. 1	6.8	10.3	10.3
Trial No. 2	11.0	15.5	16.1

226. Yields quoted in bags padi (140 lb.) per acre. The greatest yields in both trials were in the No. P,L, treatments giving 13 bags per acre in Trial No. 1 and 18½ bags per acre in Trial No. 2.

Cane Grove

227. A fertilizer trial with rice on pegassy clay soil at Cane Grove Land Settlement gave the following results which show the spectacular results from liming and fertilizing these soils.

No treatment	-	1,000 lb per acre
Lime and N.P.K.	-	8,920 " " "
Lime and NP	-	6,192 " " "
Lime and N	-	6,176 " " "
Lime only	-	3,840 " " "

PASTURE AND FODDER

228. The grass and legume collection was moved from the Botanic Gardens to the Central Agricultural Station and established in larger sized plots to allow observations on reaction to grazing. The better growth of the grasses on well drained land was quickly noticed and it is clear that there are some very useful species for multiplication and use for rotational grazing.

229. The followign species and areas were established:-

GRASSES NAME	COMMON NAME	ACRES
Digitaria Decumbens	Pangola grass	30
Ischaemum Timorense	Locuntu grass	20
Brachiaria Mutica	Para grass	30
Cynodon Dactylon	Coastal Bermuda	0.8
Dichanthium Caricosum	Nadi Blue Grass	0.8
Paspalum Notatum	Bahia grass	0.8
Paspalum Dilatatum	Dallis grass	0.8
Panicum Maximum	Guinea grass	1/30
Pennisetum Purpurascens	Elephant/Merker	1/30
Tripsacum Laxum	Guatemala grass	1/20
LEGUMES		
Pueraria Phaseoloides	Tropical Kudzu	0.8
Stizolobium Nivea	Mauritius bean	1.6
Indigofera Endecaphylla	-	1/20
Indingofera Subulata	-	1/20

230. The grasses to be used for the development of rotational grazing are Locuntu, Para, Pangola, Nadi Blue Coastal Bermuda. All of them are sward grasses with the exception of Para grass and are known to stand up to grazing with proper management in other parts of the world. Guatemala grass and Merker grass will be mulitplied for the production of cut fodder but the emphasis is to be on grazing in order to find a means of cutting down on labour costs.

231. Tropical Kudzu, Mauritius beans and Cow peas are vigorous legumes which give a good yield and ground cover.

232. There are a number of indigenous grasses and legumes which require testing:- Leersea hexandra, Paspalum distichum, Rhynchosia minor and Vigna vexillata.

WEEDICIDES

233. Previous annual reports of the Department have not devoted a special section to this subject and the importance of the modern selective herbicide has not been emphasised sufficiently in view of their significance to agriculture and, in particular, the sugar industry. The wider application of herbicide to rice, coconuts and other crops can be easily seen and continual research on new substances, methods and times of application have become a regular function of the Economic Botany Division. The present use and projected research of herbicides is reviewed below.

234. The Sugar Industry are the main users of the modern weedicides and their use dates from about 1950. The use of 2:4D sprayed by hand or by aeroplane against the complex of non-gramineous weeds is the main use and has become an economic necessity in view of rising labour costs. The Bookers Sugar Estates manufacture their own amine from 2:4D acid.

235. In canals and trenches, pentachlorophenol is used effectively against underwater weeds, which slow down the flow of water and obstruct water transport. 2:4D is effective against broadleaved weeds which grow on the surface of the water but certain grasses remain a problem.

236. Dalapon and Sodium chlorate are effective against gramineous weeds. Dalapon at 2 lbs. per acre is used as a repeated application and is cheap and successful against Para-grass and (Echinochloa colonum). Sodium chlorate gives a good kill of (Leersea hexandra).

237. Drift spraying with 2:4D in rice using a Swingfog machine has been proved effective and economic on a commercial scale at the Mahaicony/Abary Rice Development Scheme and a heavy sedge flora was controlled by $\frac{3}{4}$ pint of amine per acre (= $\frac{1}{2}$ lb. acid). Knapsack type sprayers are also effective but coverage is slower.

238. Many other weedkillers have been tried and proved uneconomic while others have yet to be tested and application methods worked out.

239. One of the big difficulties over the use of 2:4D has been damage to neighbouring susceptible crops at a considerable distance by actual drift and vapour drift. Some crops including jute, cotton, tomatoes, etc, are very sensitive to 2:4D and spraying on some sugar estates is precluded because of proximity to other cultivation. Aerial low volume spraying and low volume swingfog spraying give the most drift.

CROP INTRODUCTION TRIALS

240. Introductions of Tomatoes, French beans, Pole beans, Cucumber, Egg Plant, Musk Melons, Water Melons, Ochro, cauliflower, Sweet Corn, Sweet Potatoes and Field corn, were made for the dual purpose of finding varieties of good quality resistant to diseases. The main sources of the planting material were the United States of America, Hawaii, Puerto Rico, Costa Rica and Mexico, but it is intended to widen the field of search.

241. The main emphasis was placed on Tomatoes in a search for varieties resistant to Bacterial wilt, Spotted wilt virus, Mosiac, Phoma fruit rot and Collar rot. The varieties Lanai, Hometon Hybrid, Nilhau, Red Cloud and Oahu gave the most promising yields and showed tolerance to the most serious disease Bacterial wilt.

242. French beans of excellent quality were grown but there was a severe infection of Bacterial foot rot in the ground used for the trials and performance was disappointing. The varieties 'Contender' 'Tender Green' and 'Wade' did well in spite of the drawbacks. The pole type french bean 'Hawaiian Wonder' was superior to all others. Pole Lima beans, particularly 'Willow leaf' did phenomenally well.

243. The local unimproved variety of cucumber showed complete resistance to Powdery mildew but did not approach introductions in yield, size or quality. 'Long Green' 'Heinz pickling' and 'Santee' were the best. The local variety has been sent abroad for inclusion in breeding programmes.

244. The Egg Plant varieties 'Rosita' and 'Florida High bush' showed much promise including some tolerance to bacterial wilt. The Musk Melon varieties 'Resistant 45' and 'Florida Golden dew' were the best. The dry season was very favourable for this crop. Water melons were less successful but some fruit of excellent quality were grown.

245. The Ochro variety 'Louisiana green velvet' is a six-week variety with high yield and good quality.

246. The cauliflower variety 'Sutton's Tropical' was the only suitable type.

247. Three introductions of sweet corn varieties and four hybrid field corn varieties did very well and the introduction programme is to be enlarged. Sweet potato varieties were being bulked. The sweet potato weevil was extremely troublesome.

B. RESEARCH AND EXPERIMENTATION

(ii) Financed under Colonial Development and Welfare Schemes

COTTON INVESTIGATIONS

248. The Cotton Officer, Mr. C.H. Brown, left the country in May on sick leave and did not subsequently return. The programme of work was continued by departmental staff but a general review of the results brought about a curtailment of the work with new plantings confined to the Central Agricultural Station.

249. The main crops grown for the Spring and Autumn harvests were both failures. Eleven acres were sown for the Spring harvest on Lusignan estate, with the varieties B.L.R. 14/25 and Coastland 284 planted on sand reef soil. Neither variety grew well but results were nullified when severe damage by drift from 2-4D weedicide [illegible] spraying occurred. A field of 10 acres grown on the Central Agricultural Station showed up the intolerance of cotton to aluminium toxicity and there was again damage from weedicide drift. One corner of the field where the soil was sandy, and free of the pegasse causing the toxicity, showed that the season was otherwise favourable for cotton establishment. The varieties grown were BLR 14/25, Coastland 284 and Tanguis.

253. Smaller plots were grown at other places and the season was unusually dry. Black arm disease was severe and non-resistant varieties were crippled but resistant varieties gave good yields of clean cotton. There was one particularly healthy plot of the variety Dar Hill at the Central Agricultural Station which yielded 1,200 lb. of Seed Cotton per acre and was successfully ratooned for a Spring 1958 crop. This practice of cutting back cotton for a second and, possibly more crops, was first tried in 1957 and there appears to be no drawbacks to the cultural practice on healthy well grown plants. A ten acre field sown in November will be cut back for the autumn 1958 harvest with varying severity of cutting and the plot of Dar Hill is to be cut back for the second time.

254. The drawbacks to cotton cultivation in British Guiana were stressed in the 1957 Annual Report. These drawbacks are the unreliability of cultivation and harvesting weather, the essential need of black arm resistant varieties, strainer and jassied control, application of artificial fertilizers and a degree of cultivation and attention not normally encountered with existing crops. The sand reef soils are the only really suitable soils for the crop and these are limited in area but the practice of ratooning, and the cultivation of the crop on organised lines by small farmers may prove to be a commercial proposition.

21. Livestock Division

General

255. The Veterinary and Agricultural Officers were on the station throughout the year. The Farm Manager resigned in October.

The Herd

256. The herd totalled 433 animals at the end of the year having been increased by the purchase of 112 heifers from local merchant and 7 Zebu bulls from Jamaica. The main breeding lines on the station are Santa Gertrudis, which were obtained from the King Ranch in Texas, and Zebu type animals from the Dairi Station and the newly acquired Jamaican animals. There was also a Hereford bull on the station but breeding policy is now set on the production of Zebu type animals which are considered to hold the greatest promise in the savannahs. The Santa Gertrudis animals are beginning to show promise.

Building and Fencing

257. The building and fencing programme continued. A combined office, store room and laboratory was constructed as well as out-station quarters at the Jawari paddock and sundry alterations to existing buildings. The cattle trail was completely fenced where it passed through the station and dividing fences between paddocks were repaired and renewed to bring the sub-division of the station into paddocks a stage nearer completion. There are now 8 fenced paddocks on the station. The corrals at the Jawari and Tamuta paddocks were repaired and extended and a simple and cutting-out gate made at Jawari.

Pastures

258. The introduction and trial of grasses showed Molasses grass (Melinis minutiflora) and Bahia grass (Paspalum notatum) to be two of the most promising types for fertilized pastures. 1½ acres of Bahia was planted at the Jawari out-station

Guinea grass (Panicum maximum) gave fairly good growth in the wet season but stalled in the long dry season. Jaragua grass (Hyparrhenia rufa) was sown from seed obtained from Venezuela and established itself well but exhibited deficiency symptoms. Other grasses under trial are Nadi Blue (Dicanthium caricosum), Pangola (Digitaria decumbens) which have shown early drought resistance. Locuntu grass (Ischaemum timorense) did well in a low lying poorly drained area. Tropical Kudzu did well under fully fertilized conditions.

Other Crops

256. Maize and cow peas were grown on the savannah but despite adequate fertilizer dressing the maize crop was a failure. Cow peas (Vigna sinensis) showed more promise. A bush clearing in the foot hills of the Kanuku mountains gave only a mediocre yield of maize. Generally speaking the foot-hills are more sheltered and give fairly good yields for one or two crops after the bush is cleared. Citrus trees were established at headquarters.

EBINI LIVESTOCK STATION

General

257. The Research Officer, Mr. S.P. Legg, in charge of the station was resident throughout the year. The F...C. Research Officer, Mr. J.R. Goode, returned from leave in May. The Technical Assistant, Mr. N.J. Cunningham resigned.

The Herd

258. The constitution of the herd at the end of the year was as follows:-

Herd on Unit	Bulls	Cows	Steers	Male Calves	Female Calves	Imp... Heifer
Sahiwal 35	1	51	-	28	30	
Sahiwal C 1561	1	8	-	4	3	
Sahiwal D 83	1	9	-	2	2	
Brahman (old)	1	27	-	14	16	
Worthy Park 27	1	-	-	-	-	-
Frome 4	1	8	-	-	-	?
Santa Gertrudis 177	1	52	-	26	11	
Santa Gertrudis 182	1	65	-	23	19	
Santa Gertrudis 200	1	62	-	24	19	
Santa Gertrudis 2	1	16	-	-	-	
Steers			94			
Unallocated						
Cows & Heifers	-	72	-	32	36	?
Station herd	-	13	-	2	2	
Miscellaneous	4	-	5			3 ...
	14	383	99	160	138	24

Total number of animals 818.

259. In addition to cattle the station breeds its own work horses which total 23 animals. The loan of a stallion from the Demerara Turf Club was a welcome introduction of new blood.

260. It will be noted that the operation of single sire units continues to be the policy with Santa Gertrudis and Zebu type animals. New Zebu animals were introduced from Jamaica to add to the Sahiwal and original Brahman type. The Santa Gertrudis animals are showing some promise.

261. The herd remained free of Tuberculosis, the few reactors to the test proving not to be affected at slaughter. Inoculation of the herd against paralytic rabies was carried out after cases occurred.

Buildings, Works and Fencing

262. Activity was concentrated on the construction of labourers quarters and kitchen in an effort to attract and obtain labour on the station. The land-rover trail to the Berbice River and the reconstruction of the stelling were completed. The trail, although difficult to traverse in parts, has made access to the station from the river a good deal easier.

263. Six miles of fencing were constructed to subdivide existing paddocks and improve the management of the simple cane units. The fencing of a number of smaller improved paddocks was also carried out.

Improved Pastures

264. The target figure for improved fertilized pastures around the station headquarters is a full square mile by the end of 1958 and the acquisition of a second tractor speeded the work of land preparation. There were 18 paddocks (included the airstrip) varying from 5 to 70 acres mainly planted with Bahia grass, (Paspalum notatum) and Pangola grass (Digitaria decumbens). Water supply on these paddocks may prove to be a problem for some time but there is little difficulty over walking animals to the nearby creek. Studies were made on the rate of spread of these two grasses.

The 1957 Calf Crop

265. A total of 183 calves (97 male and 86 female) exclusive of abortion were born during the year. Losses of calves shortly after and for a few weeks after birth are high, and 30% of these losses prove to be calves from heifers. Birthweights ranged between 46.5 and 92.6 lb. with bull calves generally heavier by a few pounds.

266. The mean daily liveweight gain of calves was 1.35 lb. and there is little variation throughout the year.

Growth of Steers

267. The regular weighing of 93 steers throughout the year showed an average liveweight gain of 0.50 lb. per head. Some backward steers received regular dosing with copper and cobalt sulphate but although condition improved there was no weight response.

Mineral Consumption

268. Records showed a consumption of 1.164 ozs. of trace elemented bone flour per head per day together with half this amount of salt.

Carcase Quality

269. Useful information was obtained on carcase quality as a total of 36 animals were slaughtered for sale on the Station.

Carcase weights of bulls born between 1950 and 1953 ranged from 428 - 503 lb. with forequarters, divided between the 11th and 12th rib, being 55.7% of the carcase weight. The liveweight of steers born between 1953 and 1955 averaged 886 lb. with average carcase weight 403 lb. a mean killing percentage of 45.38.

SOIL SURVEYS

270. The separate soil survey schemes for the Coast and Interior were combined during the year and agreement was reached that the technical direction of surveys should be carried out by the Regional Research Centre at the Imperial College of Tropical Agriculture while Administrative control remained with the Director of Agriculture. The Soil Surveyors would finalise their reports and maps in Trinidad where they would have the benefit of the expensive soil knowledge and research facilities of the centre. The majority of soil analyses would still be carried out at the Chemistry Division of the Department.

271. The new survey scheme envisages soil surveys of the Mazaruni basin, Merume, Mahdia and Kaimaraka in the interior as well as the survey of land adjacent to a projected main road to the Rupununi. On the coast surveys of projected development areas for drainage and irrigation including the eastern part of Boerasirie and Hog Island will receive priority but it will be possible to carry out surveys on projected Land Settlement Schemes concurrently.

272. The completion of the soil reconnaissance of the coastal area by helicopter commenced by Mr. C.H. Simonsen under the International Co-Operation assistance of the United States Operations Mission is also to be carried out.

273. Crop trials to study land use on virgin areas of the interior are likely to be delayed until the agronomists appointed finish their training in two years time. The necessity of soil surveys prior to land use is beginning to be realised by the majority of persons concerned with planning. The extreme poverty of most of the Rupununi soils now proved by soil survey limits the land use of the area and the likelihood of including toxic soils in expensive drainage schemes are instances which show that soil survey is an essential preliminary step.

SOIL SURVEY OF HOG ISLAND

274. An area of 5,200 acres of the 14,000 acre island in the Essequibo estuary was surveyed on cut lines at ¼ mile intervals across the breadth of the island. The soils were augered at intervals along the lines and plotted on the map. The island proved to be very low lying and covered by typical coastal swamp forest, subject to tidal flooding. Empoldering and drainage would have to be carried out prior to Agricultural development. A series of low silty clay ridges running the length of the island barely rise above the intervening more clayey waterlogged areas. The most important soil type, suitable for cultivation is a low humic gley, constituting 2,300 acres of the surveyed areas, 1,000 acres of a shallow pegasse soil should be cultivable but is not used at present. The potential of 1,000 acres of deep pegasse soil is doubtful. Both the pegasse soils show high contents of toxic alumina.

MAHDIA VALLEY

275. A detailed reconnaissance survey covering 50 square miles of the Mahdia valley was carried out and it would appear that the area holds out little prospect for large scale agricultural development. The soils occurring on the basic rocks are on very steep slopes or are capped by lateritic ironstone or ironstone gravels when on the flat. The soils arising from the acid and intermediate metamorphic rocks, newer granite and the white sand geological series are very base dificient. On some restricted areas locuntu grass (Ischaemum Timorense) was growing well and cattle were healthy.

KAMARANG VALLEY

276. The reconnaissance survey of the Kamarang valley showed fairly promising soils capable of supporting permanent agriculture. Nitrogen and potash were adequate but exchangeable bases and phosphate were low. There was a large enough area for settlement and a detailed survey and crop trials will be necessary later.

KAMAKUSA (Upper Mazaruni)

277. The soils are suitable for agriculture with the use of fertilisers. Analysis of samples showed slight acidity, low salts and fair amounts of organic matter, nitrogen and phosphate.

CENTRAL AGRICULTURAL STATION

278. A field survey classified the soils of the station into Coastland clays, sandreef soils and humic soils. Shell beds are occasionally incorporated in the clay. The sandreef soils occur as belts across the station and are of greatest importance where they occur in the top 36 inches. The humic soils which have a high proportion of peat in the top 18 inches show toxic amounts of aluminium and require heavy lime and phosphate dressings.

MARA

279. A detailed soil survey was made of Plantation Mara and the adjoining estates of New Ma Retraite, Vriendschap and Ma Retraite. The main soil was a clay varying in acidity throughout the profile which occupied by far the greater part of the area. This soil is considered suitable for rice but may require nitrogen and phosphate fertilisation. There is no problem of aluminium and sulphate toxicity. The area of this soil on Plantation Mara alone was 1,152 acres with limited areas more elevated and suited for citrus, cacao, oil palms and ground provisions. A sandy clay soil of high fertility occurred near the road and might be best used for houses and gardens.

FERTILIZER INVESTIGATIONS ON RICE

280. Mr. J.H.L. Messing took up the appointment of Soil Scientist in October on the renewed Colonial Development and Welfare Scheme for the studies on the nutrition of the rice plant. Following the results of the former Soil Scientist Mr. J.K.R. Gasser, which were reported in the 1956 Annual Report, it is considered that the most useful line of work will be to carry out further trials and concentrate on the toxic soils.

Spectacular yield increases on these soils can be achieved by phosphate application but there is a good deal more work required on the problem. Large areas of toxic soils can be brought into use if their economic use can be solved

CENTRAL AGRICULTURAL STATION

281 Development continued on the Central Agricultural Station at Mon Repos, East Coast, Demerara. The 1,000 acre property was purchased and is being developed with Colonial Development and Welfare funds. The Station is to become the Department's main research and demonstration centre for crops and livestock and the Livestock Farm and pasture research work formerly in the Botanic Gardens, Georgetown were moved. All rice breeding work has been carried out on the station since 1956. The jute research organisation transferred its activities completely during the year. All research staff are to reside on the station where laboratories are to be built and the Assistant Director (Research), Plant Pathologist, Entomologist, Economic Botanist, Veterinary Officer and Rice Storage Investigations Officer took up residence and set up temporary laboratories during the year.

282. The housing programme on the main compound was completed and consists of 14 senior staff houses, 10 junior staff houses and 16 labourers quarters. At the Stock Farm 2 junior staff houses and 6 labourers cottages were completed.

283. The general farm buildings completed on the main compound were the store workshop, implement sheds, jute factory, two jute storage bonds, power house and petrol store. Livestock buildings completed were the dairy barn, dairy and milking parlour, calving pens, calf pens, bull pens, goat buildings, sheep pen, pig sties and sundry poultry buildings.

284. Foundations for the site of the new laboratories were examined by the Public Works Department and it is hoped that work may start on this building in 1958 to complete the programme of development. In the meantime, 3 houses and a portion of one of the storage bonds have been used for temporary office and laboratory accommodation.

285. The water supply is obtained from the artesian well bored in 1956. A 42-foot high water-tower, aeration and filtration plant, and pump house was laid down as well distribution pipes to the houses.

286. The electric generating plant consisting of three 22 K.v.a. Lister diesel engines and generators was installed and provides power and lighting for houses, workshop, incubators, laboratory apparatus, etc. Distribution will be extended to the Livestock Farm and arrangements are being made to put the wiring underground.

287. Work continued on the construction of the burnt-earth road from the main Georgetown - New Amsterdam road as far back as the Livestock Farm. Internal roads were made at the Stock Farm. Communication along the greater part of six mile length of the station for tractors and equipment has been achieved by the installation of boxes at the field drainage outlets.

289. Purchases were made of machines, implements and other equipment to achieve an advanced state of mechanisation and to provide a wide variety of equipment for trial.

290. Agricultural activity, which is reported in other sections of this report, involved the growing of rice, jute, grass, maize, cotton, cowpeas and miscellaneous other crops on a smaller scale.

HOSORORO STATION

291. The Agricultural Officer, Mr. D.E. Gollifer, appointed under the Colonial Development and Welfare scheme for the development of the station arrived in October and was first stationed at the Central Agricultural Station where he had the opportunity of familiarising himself with local conditions before taking over the station. The development plans include the expansion of the cacao, citrus, avocado pear and robusta coffee on the hill land and the development of the pegasse soil of the riverain strip for suitable crops. The good growth of Locuntu and Para grass on the riverain strip should make it possible to increase the cattle on the station and there are plans for the development of animal husbandry in general.

292. Activity during the year was the extension of the cacao nursery and the improvement of the propagation unit. Experiments on the pegasse soil were carried out and there was a response to manuring with lime and phosphate. Grasses, ginger and cowpeas appeared to be suitable crops. The existing orchards were maintained.

C. VETERINARY AND ANIMAL HUSBANDRY

ANIMAL HEALTH

Bacterial and Virus Diseases

(i) Paralytic Rabies

293. Outbreaks occurred in all areas. About 55,000 head were inoculated. The disease is spread by vampire bats and research is necessary on the habits of these vectors.

(ii) Foot and Mouth Disease

294. The quarantine measures to prevent the introduction of Foot and Mouth disease from the Rupununi were again successful. The restrictions were relaxed in May.

(iii) Fowl Pox (Yaws)

295. Large scale vaccination controlled the regular occurence of this disease in flocks.

(iv) Tuberculosis

296. There were no reactors to the Tuberculin test in Government herds. There were only 11 reactors (1.16%) among the 941 animals entering Land Settlements.

(v) Miscellaneous

297. Single cases of Anthrax and Strangles (Equine distemper) occurred as well as sporadic cases of mastitis and a few suspected cases of Swine fever.

Protozoal Diseases

(i) Anaplasmosis and Piroplasmosis

298. 58 cases (2 in horses) of Anaplasmosis and 53 cases of Piroplasmosis were treated. Premunisation of young stock at the Livestock Farm continued as in previous years.

(ii) Coccidiosis in Poultry and other animals

299. This disease is quite prevalent in young poultry and numerous cases occurred in young cattle

Fowl Typhoid and Cholera

300. Both diseases were responsible for heavy losses, the former being dealt with by the blood agglutination test.

Miscellaneous

301 There were sporadic cases of Equine trypanosomiasis in the Rupununi. Histomoniasis was on the increase and there was single case of Trichomoniasis.

Parasites

302. Internal worms were dealt with by routine dosing and Ticks were controlled by Gammatox fluid and Paste dip. Lorexane cream was effective against screw worms in wounds, and on the navels of young calves. Skin nodular worms were also encountered.

Fungus Diseases

303. Numerous cases of Thrush, (Moniliasis) Aspergillosis and Favus occurred. Ringworm in sheep was seen.

VETERINARY RESEARCH

304. Little research was possible. The results of feeding a special mineral mixture high in Magnesium and Sodium to animals suffering from Liver Cyrrhosis on the Intermediate savannahs were inconclusive.

305. It is evident that trace element dificiencies are of importance in the Cattle industry, and Copper is one of the most significant elements.

306. Infertility in cattle is a common occurence and may be related to mineral and vitamin deficiency. The feeding of brewers grain with its high content of Vitamin E markedly improved conception rates.

ANIMAL BREEDING AND ANIMAL HEALTH

Dairy Cattle

307. The F^2 cross from the Holstein-Sahiwal is unsatisfactory. It is proposed to concentrate on the 5/8 to $\frac{3}{4}$ Holstein cross for milk production.

308. A Friesian bull was imported for the artificial insemination service during the year. The artificial insemination service was extensively used.

309. Many dairy cattle with problems of sterility belonging to farmers, sugar estates and the Livestock Farm were treated with considerable success.

310. On the Livestock Farm the total production of milk was 129,506 pints as compared with 179,126 pints for the previous year.

311. The Revolving Heifer Scheme was continued during the year. In-calf heifers were distributed and some heifer calves returned.

Beef Cattle

312. Good progress was made. An importation of Brahman Zebu cattle was made during the year. Of these 5 bulls and ten heifers were sent to Ebini and 7 bulls to St. Ignatius. In addition 150 heifers bought locally were added to the St. Ignatius herd. Quite a number of half bred Santa Gertrudis calves were born during the year and two pure bred Santa Gertrudis heifer calves were born at St. Ignatius and progressed favourably.

313. The Sahiwal bull at Ebini continued to breed well.

Pigs

314. The breeding of Large White and Large Black pigs continued. There has been a definite shift to the Large White since the previous year as farmers are gradually getting accustomed to their superiority. The increased development of the Large White is necessary both for the export market and also for the home trade.

Sheep

315. During the year arrangements were made for the importation of Border Leicester sheep in order to upgrade the local type.

Goats

316. The Saanan buck was discarded and now the emphasis is on the British Alpine.

Donkeys

317. The demand is definitely on the decline as there is a tendency towards mechanisation.

Poultry

318. Egg production for the year was 115,015 eggs as compared with 77,289 for the previous year. During the latter half of the year there was an extensive outbreak of Fowl Typhoid resulting in heavy losses and rigid culling had to be enforced in order to stamp out the disease. This resulted in a substantial diminution of egg production and also chickens.

319. There was a further increase in broiler production. Imports of poultry carcases were allocated in relation to home production.

320. The following were distributed from the Livestock Farm to improve local breeds:-

Cockerels	162	Chicks	18,759
Pullets	846	Hatching Eggs	40,903

D. FISHERIES

321. The Fishery Services of the Department are operated as separate divisions covering the Marine fisheries and the Inland bodies of water such as rivers, canals and reservoirs.

Marine

322. The main activity of the Marine Fishery Division was to foster the newly opened wholesale fish market and the other ancillary services made available for fishermen at the Government Marketing centre. Facilities have been provided for the landing and handling of fish, the treatment of nets, repair to boats and sale of ice to fishing schooners. In addition there is a fisherman's canteen and dormitory.

323. The 70 ton fishery Research Vessel "Cape St. Mary" arrived in April to commence a trawling survey of the productivity of the waters off British Guiana between 10 and 100 fathoms. The coast was divided up into 9 sectors each of which was fished in turn. One full survey of all sectors and 5 sectors of the second survey had been completed by the end of the year. 888 trawling hours were recorded. A total of 178,213 lbs. of fish were caught mainly Croaker, Sea-Trout and Banga Maree.

324. Financial assistance continued to be provided to fishermen by the refund of duty on all fishing gear, gasolene, lubricating oil, dieselene and net preservative

Inland

325. The promotion of fish culture using (Tilapia mossambica was continued in ponds of varying size up to 5-acre flood fallow fields on sugar estates. These fields showed extremely poor survival against predators but a smaller field (0.65) acre) gave a yield of 625 lb. after 11 months. Fingerlings for stocking ponds are grown at the Botanical Gardens hatchery occupying 3.4 acres with 23 small and one large ponds. 25,000 Tilapia were distributed from these ponds during the year.

Research

326. The Israeli and Punten carp kept in the Botanical Gardens ponds were spawned successfully but survival was low. Alternative culture methods may make it possible to use these fish for pond culture.

327. Fish pots and traps caught predatory fish almost exclusively. 148 lb. of fish resulted from 1,980 trap-days.

328. The two brackish water ponds at Onverwagt 5.3 acres in extent were stocked with about 8,000 fishes of Megalops, Centropomus, Mugil and Tilapia species. One male Tilapia weighed 2 lb. at the end of eight months.

329. The division was fortunate in obtaining the services of Mrs. R.H. Mc Connell in an honorary capacity to carry out freshwater fish research from April onwards. The ecology of indigenous species was studied with a view to finding fish suitable for pond culture and to help control water weeds in trenches and canals. 20 species have been caught regularly in traps.

330. Particular attention was given to the fish in the Rupununi district where the Amazon fauna meets the Essequibo. Over 100 species were collected of which 40 were regarded as good eating fish and a number suitable for trials in ponds and trenches. Information was gathered on life-histories, feeding and breeding habits, growth, rates and favourable harvest periods in the Rupununi. Myletes and Myelus species known as "Morocut" and "Pacu" are regarded as the types with the greatest possibilities.

331. The brackish water fish culture station at Onverwagt was operated with two ponds totalling 5.3 acres pending the allocation of additional funds for the completion of the work.

E. MARKETING DIVISION

332. The general policy of the division remains unchanged, namely, encouraging local agricultural production by offering producers an assured market, paying economic prices and generally maintaining fair prices and equitable distribution of supplies to consumers.

333. The following services were operated by the Marketing Division.

(I) Government Produce Depots

(II) Processing Factory

(III) Ham and Bacon Factory

(IV) Milk Control Organisation and Pasteurisation Plant

(V) Fish Marketing Centre.

334. The trading results of the Marketing Schemes were as follows:-

	Operating Expenses	Gross Profit	Nett Loss
	$	$	$
Government Produce Depots & Ham & Bacon Factory	117,184.43	36,176.39	81,008.04
Processing Factory	36,471.36	794.66	35,676.70
Fish Market	85,974.06	39,437.87	46,536.19
Milk Control and Pasteurisation Plant	99,452.10	31,969.78	62,482.32
Total	334,081.95	108,378.70	225,703.25

335. The total value of purchases and sales were as follows:-

	Purchases	Sales
Government Produce Depot	279,410.36	316,137.79
Processing Factory	155,031.80	162,595.95
Fish Market Centre	149,206.06	160,877.41
Milk Plant	226,685.68	266,133.91
Total	810,333.90	905,745.06

(I) GOVERNMENT PRODUCE DEPOTS

336. The depot maintained centres for purchasing farmers' produce at Charity and Diamond (Pomeroon), Parika (West Demerara), New Amsterdam (Berbice) and Georgetown. Purchasing in the North West District was taken over by the Farmers' Co-Operative Society. With the exception of New Amsterdam and Georgetown which operated on a wholetime basis, these centres were visited fortnightly or weekly by Marketing Assistants on such days as the Government steamer made its call.

337. The supply of ground provisions was for the most part inadequate and the depot had to face up to keen competition from hucksters and, moreover, suffered the disadvantage of having to support its laid down policy of paying farmers subsidised prices for produce which resulted in financial loss.

338. Wholesale trading was done with retail traders (hucksters), Government institutions and other large consumers. Retailing of produce was carried on at the Central Depot, Bourda Branch and New Amsterdam. The C.O.D. service continued to be satisfactory and expanded with the purchase of an additional van.

Plantains and Ground Provisions

339. Purchases for the year are given in the table below so that comparison may be made with purchases in 1956.

	1956 lbs.	Value 1956 $	1957 lbs.	Value 1957 $
Plantains	520,744	26,941.26	280,384	15,140.13
Sweet Potatoes	116,630	6,016.34	33,328	1,944.72
Yams	67,232	3,958.87	21,647	1,405.37
Tannias	20,845	1,157.90	6,483	223.86
Eddoes	74,088	3,032.33	140,300	1,507.42
Sweet Cassava	11,348	413.71	8,350	442.84
Total	810,888	41,520.41	491,102	20,671.56

340. Supplies were generally inadequate and regular importations from Surinam were sold on the Courantyne and in New Amsterdam.

Fruits

341. Supplies from the North West District and Pomeroon were again disappointing and rather less than in 1956. Comparative figures are given below.

	1 9 5 6	1 9 5 7
Bananas	17,313 lb.	12,675 lb.
Oranges	55,867 (nos.)- $2,837.86	51,834 (nos.)- $2,525.3
Grapefruit	14,098 (nos.)	18,374 (nos.)

342. Importation from Surinam was necessary

Coffee and Cacao Beans

343. 20,743 lbs. of coffee beans were purchased at a cost of $11,337.08 while purchases of cacao beans amounted to only 3,127 lbs. valued at $253.50.

Livestock Feeds, Veterinary Supplies, Insecticides and Fertilizers

344. Sale of these commodities by the depot, and also through the District Agricultural Superintendents and Instructors acting as distributing agents for the Government Produce Depot, continues to provide a valuable service to farmers generally and more particularly so to those in remote areas.

(II) PROCESSING FACTORY

345. The operation of the processing factory for the manufacture of livestock feeds was handicapped by a shortage of low priced ingredients (particularly stock-feed rice) for inclusion in the rations manufactured. Competition from a local firm and importers was severe as prices could not be reduced sufficiently and sales were much smaller than in 1956. A comparative statement is given below.

	1956 lb.	1957 lb.
Chick Starter	196,983	52,253
Growing Mash	190,036	67,125
Layers Mash	578,651	282,523
Grower-Layer Mash	1,000	-
Breeders Mash	1,000	83,020
Broiler Starter	1,745	250
Broiler Finisher	790	500
Dairy Meal	623,041	455,406
Cattle Feed	28,700	-
Calf Gruel	6,480	-
Calf Feed	3,000	-
Calf Meal	41,002	38,502
Pig Starter	206,876	87,905
Pig Grower	354,841	111,517
Pig Finisher	82,000	38,150
Pig Meal	2,660	-
Pig Feed	115,400	-
Pig Mixture	7,000	-
Sow Ration	182,522	201,950
Goat Feed	200	-
Horse Feed	46,700	43,000
Turkey Ration	-	563
Weaner Ration	-	25,500
Total	2,470,627	1,488,164

Corn.

346. Purchases of corn totalled 1,260,868 lbs. valued at $69,564.81 as compared with 760,722 lbs. in 1956.

Corn Meal.

347. A comparative statement of corn meal manufacture is given below.

	1957 lb.	1956 lb.
Amount of Corn Meal Manufactured	84,510	46,242
" " " " Sold	82,311	50,401
" " " " Used in Feeds	681	1,748
" " " Germ Manufactured	353	2,344
" " " " Sold	360	1,099
" " " " Used in Feeds	321	1,302
" " " Bran Manufactured	59,962	24,282
" " " " Sold	1,946	253
" " " " Used in Feeds	50,917	25,355

(III) HAM AND BACON FACTORY

348. The Plant continued to operate for the benefit of the Pig industry and a total of 2,633 pigs were purchased as compared with 1,742 in the previous year. The total value was $121,667.12.

349. 82,017 lbs. of pork were exported to Trinidad valued at $49,422.32.

350. Production of finished products for the year was as follows:-

Ham	-	5,917 lbs.
Bacon	-	44,808 lbs.
Sausages	-	9,139 lbs.
Lard	-	7,324 lbs.

351. The Plant continues to serve a most useful purpose in encouraging the pig industry to produce high quality, properly fed animals.

(IV) MILK CONTROL ORGANISATION AND PASTEURISATION PLANT

352. The new Pasteurisation Plant was opened on July 26th, 1957, and took over the operations of the Milk Control Organisation. The total quantity of milk purchased was 268,408 gallons valued at $218,001.18. The Pasteurisation Plant handled 117,851 gallons of this total.

353. There was a shortage of milk after opening the Plant and 73,176 gallons of recombined milk was distributed.

Ghee

354. 1,072 lbs. of ghee was produced.

(V) FISH MARKETING CENTRE

355. The Fish Marketing Centre commenced operations in January, and a total of 307,789 lbs. of fish were purchased valued at $130,742.00. The main types were Snapper, Queriman, Sea Trout, Grouper and Banga Maree.

356. In addition the 178,213 lbs. of fish landed from the research trawler "Cape St. Mary" was handled.

357. Functions of the market other than the wholesale purchase and sale of fish is the operation of a retail market, the sale of ice to fishermen at $1.70 per block, and the cold storage of fish for market vendors. There are facilities for the repair and treatment of nets, the repair of boats, and a canteen and dormitory.

F. BOTANICAL GARDENS

386. The Gardens were maintained in good condition and the exceptionally dry year assisted with the programme of rehabilitation. The lawns and plants suffered from the drought, but no permanent harm resulted and there were only a few losses. Bougainvillias (Lagerstroemia indica) and Ixoras flowered well. Attention was paid to drainage, repairing banks of the lakes, the rebuilding of shelters and the redesigning of the oval and a number of other beds. A collection of orchids belonging to Mr. Henry Seaford was purchased. A total of 4,317 fruit trees, mainly oranges, was supplied and 7,200 ornamentals. 28,533 packets of vegetable seeds were sold, and 872 packets distributed free to district stations, school gardens and Government institutions.

G. ECONOMICS DIVISION

389. Mr. W.R. Asfour was appointed Agricultural Economist in April and was required to assume charge of the Rural Youth and Agricultural Education and Information Divisions of the Department in addition to his own duties. In these circumstances the research work of the Division was much curtailed and confined to routine statistical collection, work on the data of the 1956 Agricultural Census and the compilation of an 'Agricultural Statistical Abstract' of British Guiana. In addition the staff of the division worked on the enumeration of an economic survey of the rice industry carried out by Dr. C. O'Loughlin of the University College of the West Indies.

390. The interpretation of the data collected for the 1956 Census gave a cattle population of 172,184 head. Acreage data for crop and other information have not yet been compiled, but the information is now in an advanced state of coding.

391. The Agricultural Statistical abstract aims at collecting all available data on the acreage and production of the major crops, imports and exports of Agricultural products; livestock population, prices, Agricultural Industries etc., and to study the trends and causes.

392. The Economic survey of the rice industry is related to the wider National Income survey and the data on the rice industry is being used by Dr. O'Loughlin for an article on 'The Rice Sector in the Economy of British Guiana'. A total of 150 rice farms were surveyed of which 91 were finally used for computation. The farms were sampled within the acreage strata 0 - 9.9, 10 - 49.9, 50 - 99.9, 100+ in Berbice, East Coast Demerara and West Coast Demerara. The farms were visited during February and March 1957, and the information obtained was for the 1956 Autumn crop with only limited data for the Spring 1957 crop which was poor on account of dry weather. Net profit per acre is low generally and gross profit shows a bias towards higher profit on smaller farms. The use of family labour is greater on smaller farms as one would expect and the survey shows up the problems of high initial cost and insufficient and inefficient use of machinery.

H. METEOROLOGICAL DIVISION

393. A separate report is issued on the work of this division.

SECTION III

BOARDS AND COMMITTEES

363. The Director of Agriculture served as Chairman of the following Boards and Committees:-

Sugar Industry Price Stabilisation and Rehabilitation Funds Committee

Bertice Fibre Research Company Limited

Sugar Experiment Stations' Committee.

364. The Director also served as a member of the following Boards and Committees:-

B.G. Rice Marketing Board

B.G. Rice Marketing Board - Executive Committee

Selection Committee for Imperial College of Tropical Agriculture Scholars

Dawson Memorial Fund Committee

Scholarship Selection Committee

Museum Committee (Board of Trustees for the Georgetown Cultural Centres)

Development Programme Technical Co-ordination Committee

Industrial Development Advisory Committee

Fisheries Advisory Committee

Regional Development Committees

365. He served as Director of the B.G. Rice Development and of the Royal Agricultural and Commercial Society

SENIOR STAFF CHANGES

366. The following changes of staff occurred during 1957:-

Appointments

Mr. D. Gollifer, Agricultural Officer, Mosororo
Mr. N. Ahmad, Agricultural Chemist
Mr. R.A. Yates, Economic Botanist
Mr. C.L.O. Fraser, Veterinary Officer
Mr. L.H. Hope, Assistant Agricultural Superintendent
Mr. H.L. Morrison, Assistant Accountant
Mr. C.F. Kennard, Agricultural Superintendent
Mr. L.F. Paul, Assistant Dairy Manager
Mr. J.H.L. Messing, Soil Scientist
Mr. E.O.M. Lewis, Chief Officer M.V. Cape St. Mary
Mr. W.G. Mitchell, Captain, M.V. Cape St. Mary
Mr. W.F. Bird, Chief Engineer, M.V. Cape St. Mary

Promotions

Mr. L.H. Hope, Assistant Agricultural Superintendent
Mr. A.A. Benn, Grade I Agricultural Instructor

Retirements

NONE

Leave

Mr. H. Paul, Chemist
Mr. E.A. Shepherd, Fishery Officer Marine
Mr. J.H. Proctor, Entomologist
Mr. B.R.B. Persaud, Grade I Technical Assistant
Mr. E.I. Hugh, Livestock Officer
Mr. L. Kong, Agricultural Superintendent
Mr. P. Poonai, Agricultural Superintendent
Mr. B.O. Ho-Yen, Agricultural Superintendent
Mr. G.L. Leitch, Agricultural Instructor
Mr. O.F. Ross, Agricultural Instructor
Mr. K.C.L. Millington, Agricultural Instructor
Mr. W.B. Telford, Agricultural Instructor
Mr. K. Rohoman, Accountant
Mr. S.M. Assad, Cocoa Propagator, Atkinson Field
Miss M. Cheong, Senior Woman Secretary
Miss L. Dolphin, Senior Clerical Assistant
Mrs. C. Churaman, B.Sc.

OFFICIAL VISITORS - 1957

367. Official visitors from overseas fro the year were as follows:-

Dr. Aurelio Malaga Alba	-	Veterinary Public Health Advisor, Mexico
Mr. A.G. Carver	-	Senior Officer Colonial Sugar Refining Company, Fiji.
Mr. R.G. Jackson	-	" " " "
Mr. J. Slater, B.G.R. M.P.		
Mr. F. Kennedy, O,B.E..	-	Head of West Indian Department 'B' Colonial Service
Mr. Riney	-	Youth Specialist in Surinam
Mr. Mc. C. George	-	Peasant Development Officer, Antigua
Prof. E.F. Nash	-	Professor of Agricultural Economics, Wales
Mr. Gilbert Macmillian, O.B.E.	-	Of Huntingdon, Quebec Canada
Mr. D. Williams	-	Colonial Attache, British Embassy, Washington
Senator, G.D. Aiken	-	Republican Member of the Agricultural and Foresting Committee
Mr. I.E. Telfer	-	Tutor, Eastern Caribbean Farm Institute
Mr. F.O. Moe	-	Prof. of Sociology Michigan State University
Dr. Manuel Alers-Montalvo-		Head of the Department of Economics and Rural Life, Turrialoa, Costa Rica.

Mr. Hugh Morrison	-	U.C.W.I. Tutor in Adult Education
Mr. H. Kuil	-	Junior Veterinary Officer Department of Agriculture, Animal Husbandry, Fisheries, Surinam.
Dr. R. Holroyd		
Sir J.A. Kershaw, M.C. M.P.		

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SECTION IV

LEGISLATION

Summary of legislation affecting Agriculture enacted during 1957

	Ordinances	Purposes
No. 13 -	The Acquisition of Land (Land Settlement) Ordinance 1957.	To repeal and re-enact the Acquisition of Land (Land Settlement) Ordinance, Chapter 180.
32 -	The Animals (Control of Experiments) Ordinance, 1957.	To regulate the practice of experiments on living animals and matter, in connection therewith.

Orders in Council

No. 1 -	The Rice (Cess) (Revocation) Order, 1956.	To revoke the Rice Cess Order, No. 11 of 1956.
29 -	The Animals Diseases (Anthrax) Order, 1957	To declare Sonoon Grid Estate an area infected with Anthrax.
52 -	The Fisheries (exemption from Registration) Order, 1957.	To exempt certain fishing boats from Registration.
70 -	Order-in-Council made under Section 15 of the Animal Diseases Ordinances Chapter 236, revoking Order-in-Council No. 29 of 1957.	To revoke Order-in-Council No. 29 of 1957.

Regulations

No. 13 -	Fisheries Regulations, 1957.	To provide foremost in connection with registration etc.

Proclamations

No. 9 - Proclamation appointing the 3rd of August 1957 as the day on which the Fisheries Ordinance, 1956 shall come into operation.

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APPENDIX

Senior Staff of the Department as at 31st December, 1957.

Director	A.F. Mackenzie, B.Sc. (Hons.) (Lond.), A.R.C.S., A.I.C.T.A.
Deputy Director (Administration)	M.D. ffrench-Mullen, D.I.C.T.A, A.I.C.T.A.
Deputy Director (Land Settlement and Marketing)	G.B. Kennard, D.I.C.T.A., A.I.C.T.A.

RESEARCH & LABORATORIES

Assistant Director (Research)	R.O. Williams, D.I.C.T.A., A.I.C.T.A.
Entomologist	Vacant
Economic Botanist	R. Yates, B.Sc., M.Sc., (Wales)
Agricultural Superintendent - Botany	P. Poonai, D.I.C.T.A, A.I.C.T.A.
Plant Pathologist	J.A. Pires, B.S.A., M.S.A.
Padi Pest Research Officer	L.D. Cleare, F.R.E.S.
Agricultural Economist	W.R. Asfour, B.Sc.(Wales) M.S. (Utah)
Sugar Agronomist	L.S. Birkett, DI.C.T.A., A.I.C.T.A.
Soil Scientist	J.H.L. Messing, B.Sc. (Wales)
Rice Agronomist	Vacant
Chemist	H. Paul, B.Sc. (Lond.), M.Sc. (McGill), D.I.C. (Lond.), F.R.I.C. (Exam.)
Chemist	N. Ahmad, D.I.C.T.A., A.I.C.T.A., M.Sc. (Br. Columbia), Ph.D. (Nottingham)
Agricultural Engineer	D.I. Allen, N.D.A., N.D. Agric. E. Grad. I.B.A.E.
Research Officer (Ebini)	S.P. Legg, B.Sc.
Agricultural Officer (Hosororo Station)	D.E. Gollifer, B.Sc. Agriculture
Agricultural Officer (St. Ignatius)	E. Cundiff, B.Sc.
Fishery Officer (Inland)	W.H.L. Allsopp, M.Sc. (Wisc.)
Fishery Officer (Marine)	E.A. Shepherd
Curator	G.E. Wolstenholme
Assistant Chemist	E.J.A. Khan, B.Sc. (Edin.)

VETERINARY & ANIMAL HUSBANDRY

Assistant Director (Veterinary & Animal Husbandry)	J.M. Fletcher, M.R.C.V.S.
Veterinary Officer	G.D. Paine, M.R.C.V.S. (Lond.)
Veterinary Officer	[illegible] Diamond, D.V.M. (Ont.)
Veterinary Officer	E.M. McWatt, D.V.M. (Ont.)
Veterinary Officer	P.F. Byrne, M.R.C.V.S. (Dublin)
Veterinary Officer	J.E.C. Fraser, B.V.Sc., M.R.C.V.S.
Livestock Officer	E.I. Hugh, M.S. (Iowa), B.Sc. Agric. (McGill), D.I.C.T.A., Dip. Agric. (Read)
Farm Manager, St. Ignatius Station	C.A Vieira
Farm Manager, Georgetown	C.A. Bannister, Dip. Agric.
Farm Manager, Ebini	T.F. Kenyon
Senior Technical Assistant	C.A. Veeresamy

AGRICULTURAL EXTENSION

Assistant Director (Field & Extension)	P.A. Chan-Choong, B.Sc., (Hons.)(Lond.), A.I.C.T.A.
Superintendent of Rural Youth Work	C.F. Churaman, D.I.C.T.A.
Agricultural Superintendent, Essequibo (Ag.)	B.L. Ho-Yen, M.Sc. (McGill), B.Sc., [illegible].C.T.A.
Agricultural Superintendent, Berbice	A.V. Wan Ping, B.Sc. (McGill), D.I.C.T.A.
Agricultural Superintendent, East Demerara	H. Madramootoo, B.S.A. (Br. Columbia)
Agricultural Education Officer (Ag.)	W.R. Asfour, B.Sc. (Agric.)
Agricultural Superintendent seconded to Rice Development Company	E.J. Gigliold, B.Sc. (Agric.) (McGill)
Agricultural Superintendent	C.P. Kennard, D.I.C.T.A., B.Sc., (McGill), M.Sc. (McGill)
Agricultural Superintendent	Vacant
Agricultural Superintendent	Vacant
Agricultural Superintendent	Vacant
Agricultural Superintendent	Vacant
Agricultural Superintendent	Vacant

Assistant Agricultural Superintendent, West Coast, Demerara	H.A. Cole
Assistant Agricultural Superintendent, North West District	M. Ramnarine, Dip (Wye Agric. College)
Assistant Agricultural Superintendent	L.H. Hope
Assistant Agricultural Superintendent	Vacant
Assistant Agricultural Superintendent	Vacant
Senior Agricultural Instructor	Vacant

MARKETING DIVISION

General Manager	C.I.V. Mittelholzer
Chief Accountant	G.F. Chan
Marketing Officer	Vacant
Manager, Government Produce Depot	Vacant
Dairy Manager	Vacant
Assistant Dairy Manager	L.F. Paul
Secretary/Accountant, Milk Marketing Organisation	D. Seeram
Captain, M.V. Cape St. Mary	W.G. Mitchell
Chief Officer, M.V. Cape St. Mary	E.O.M. Lewis
Chief Engineer, M.V. Cape St. Mary	W.F. Bird

SENIOR ADMINISTRATIVE STAFF

Executive Officer	E.S. Douglas
Accountant	K. Rohoman
Senior Woman Secretary	Miss M. Cheong

OFFICERS WORKING ON COLONIAL DEVELOPMENT AND SCHEMES

Soil Surveyor	J. Stark, B.Sc.
Soil Surveyor	H. Hill

FOOD & AGRICULTURAL ORGANISATION PERSONNEL

Research Officer, Ebini Livestock Station	J.R. Goode, B.Sc.